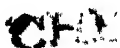


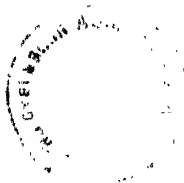
THE BOOK OF THE HOME

THE BOOK OF THE HOME

A PRACTICAL GUIDE FOR
THE MODERN HOUSEHOLD

Edited by 

DAVIDE C. MINTER



VOLUME IV

With an Introduction by

LADY NORA H BENTINCK

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INTRODUCTION

Flowers in the Heart

By LADY NORAH BENTINCK

One of the most human of British writers, Robert Louis Stevenson, thus in verse described a "home":

*" Flowers in the garden, meat in the hall,
A bin of wine, a spice of wit,
A house with lawns enclosing it,
A living river by the door,
A nightingale in the sycamore! "*

And he puts the flowers first!

It has been said that anyone having the love neither of flowers, nor music, nor children in the heart is surely a subject for pity. Perhaps this has been said just because these three things are the greatest constituents of happiness, and therefore go far to the right making of a home—for without children, music, and flowers we should indeed be an arid waste.

Children, whose soft dimpled hands touch the deepest chords in the human heart, the purest ones. . . . Music, which satisfies the sensuous within us, and links us with magic chains to that divine fire whose spark is alight in most of us. . . . And lastly, flowers, which give to life the æsthetic touch so necessary in the rush and tear of the material side of our modern lives.

Whoever possesses a square yard of earth can have a garden, and the pleasure of a garden is that, whether great or small, it can always be beautiful. The cottage garden, tended by the father after working hours and by his children, is just as much a thing of beauty and so "a joy for

ever" as the splendid one with laid-out terraces, countless borders, and expensive plants from all quarters of the globe, presided over by an army of gardeners.

Few interests are so easy of attainment and so delightfully absorbing as the cult of flowers. The study of their ways and habits, the expectancy of their coming, the colour scheme, and the planning of a never-ending procession of sweet-smelling, brightly-tinted flowers from February till November, is indeed one of the most entirely engrossing and enduring of joys that life can offer.

The variety of gardens is endless. There are those of the north and those of the south; tropical ones and eastern ones; Japanese and Dutch; Scotch and French. Then there are wild gardens and formal ones; those of rock and water; rose gardens and herbaceous borders; and yet again, those wherein the flowering shrubs form the outstanding feature, with their exquisite blooms in the springtime, their red and rosy summer foliage, and their jolly scarlet, yellow, and russet berries during the winter months—gleaming forth like jewels from beneath their mantle of snow.

The blue border appeals to many people, and I remember one backed by high yew hedges with a wide grass path up the middle, most cleverly arranged with blue flowers—from the tall Canterbury bell, anchusas, lupins, and delphiniums to the low-growing love-in-the-mist, forget-me-nots, pansies, and gentians. In the distance was a large stone basin in which fell a pellucid stream, and round the borders flamed golden eschscholtzia.

The Japanese garden is amusing, for it requires a certain amount of building to make it perfect, with its little tea-houses, and quaint bridges crossing and recrossing each other across the gushing streams. The Dutch garden, though also needing a certain expenditure, is more within the grasp of the majority, for when once the flags have been laid down, it only wants roses and lavender—a delicious combination—to complete it.

The herbaceous border, although extremely effective, often fails to give us as much pleasure as it should, because so few of the flowers are at their best at the same time, and the possessor of such a border is usually bewailing to her guests that it was "just perfect last week", or, "It will

be perfect next week"; but *the perfect hour* never seems to be the time when one visits it!

The rock-garden has great charms; and one which is well laid out adds much to the beauty of any grounds, no matter how small. The little plants which are suitable for climbing and creeping, such as alyssum, aubrietia, snow-on-the-mountains, stonecrop, and dwarf phlox, grow from about half an inch to ten inches in height and are all the natural inhabitants of your rock garden. The variety of their colour is endless.

The charm of gardens in sunny warm climates is that the flowers just grow in their own sweet way, and a little plant or root carelessly stuck into the ground blooms magically in the greatest abundance and showers its blossoms with reckless beauty.

But of all set gardens, the rose garden is the sweetest. It is so reasonable; granted that certain care is taken of it at stated times, it will always yield its best. It is the garden that gives the most effect with the least outlay of labour, and when a carefully selected list of bulbs is added to it, a never-ending succession of blooms of various kinds, colours, and scents is ensured from February till close on Christmas.

The English cottage garden is hard to beat, the cottages themselves in their varying designs making an ideal setting for all the sweetest and commonest of English garden flowers. There are stone houses thatched or grey-tiled; there are red and black ones; and again, white and black. Those who know these gentle homely types of England's past cannot but love them and the lanes and the villages which they have beautified throughout the length and breadth of our dear Isles.

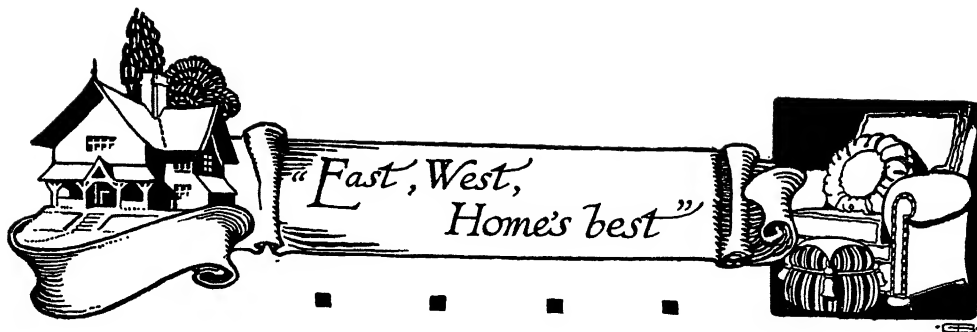
Trim and sweet and gay are they with their pansies and sweet-williams and phloxes; their tall sun-flowers peeping in at the casement; and the mauve wistaria, gnarled and twisted, holding as it were the old walls of the little homes together. To the sun's hot rays the soft green sweetbriar gives forth its sweet perfume, and on still warm summer nights the scented stock and tobacco plant are no less generous to the moon. The honeysuckle makes a home for bees as it climbs wanton round the porch and up to cottage roof, and the star-like clusters of white clematis rejoice our hearts in the early days of spring.

Towards the autumn come the golden montbretias, the proud gorgeous dahlias, and the soft fleecy chrysanthemums, in their many pastel shades.

But even when the dead of the year has come—even when all is brown and sodden and lifeless—still will the rose be found to bear a bud and hold within itself a lovely shade of pink. The last rose of summer is truly left blooming all alone, but she is a faithful little flower, and, notwithstanding her thorns, she is the best of all our garden friends.

Mabel Bartlett

IN THE GARDEN



In the Garden

GARDEN PLANNING

Consider the Site as a Whole

It is now generally recognized that even the smallest plot repays a hundredfold a little careful forethought spent on its laying out and design, and that it is unnecessary to have acres of land in order to possess a garden full of the charm and individuality so beloved of garden-owners. In order to make the best of any garden, it is necessary to consider the site as a whole, and carefully plan the design so as to know what it is intended to do with the whole garden, before attempting to lay out any portion.

Most people who are about to plan a garden have a series of ideas, somewhere at the back of their minds, of how they want their garden to look. Some of these ideas may be unsuitable, and some may be easily adaptable to the site in question, and to work out the design to scale on paper first is a less expensive way of finding out which ideas are suitable than to try and carry out one scheme after the other on the ground itself.

Making the Plan

The first thing to do, then, is to make a careful survey of the site of the proposed garden, taking special note of any natural features that are to be retained. Based on the measurements, and the aspect of the plot, the garden can then be planned to scale on paper. If the house is not already

existing, the plan of the garden may be considered before the building is begun, so that the house can be placed to the best advantage in connection with the garden. A few feet either way may make all the difference, and waste of space and many future disappointments and difficulties may be thus avoided.

Few people are fortunate enough to have a wide choice of sites, and the majority have to make the best of what they can get. The more fortunate will do well to search for a site having a gentle slope to the south-west with the road on the north side, this aspect being most suitable for the pleasure garden.

If the garden is big enough to allow of its introduction, a kitchen garden, or at least a plot for the favourite vegetables, is usually required. This, for convenience, should be as near as possible to the kitchen premises and in an open sunny position. For the same reason the tool and potting sheds, frames or greenhouse, if required, should be near together, and in an inconspicuous position.

The accompanying illustration shows how a garden can be planned on paper. The idea governing the design is a suitable and attractive arrangement which ensures privacy and a pleasant outlook from the side and back of the house as well as a good approach. Attention may then be turned to the planning of the flower garden.

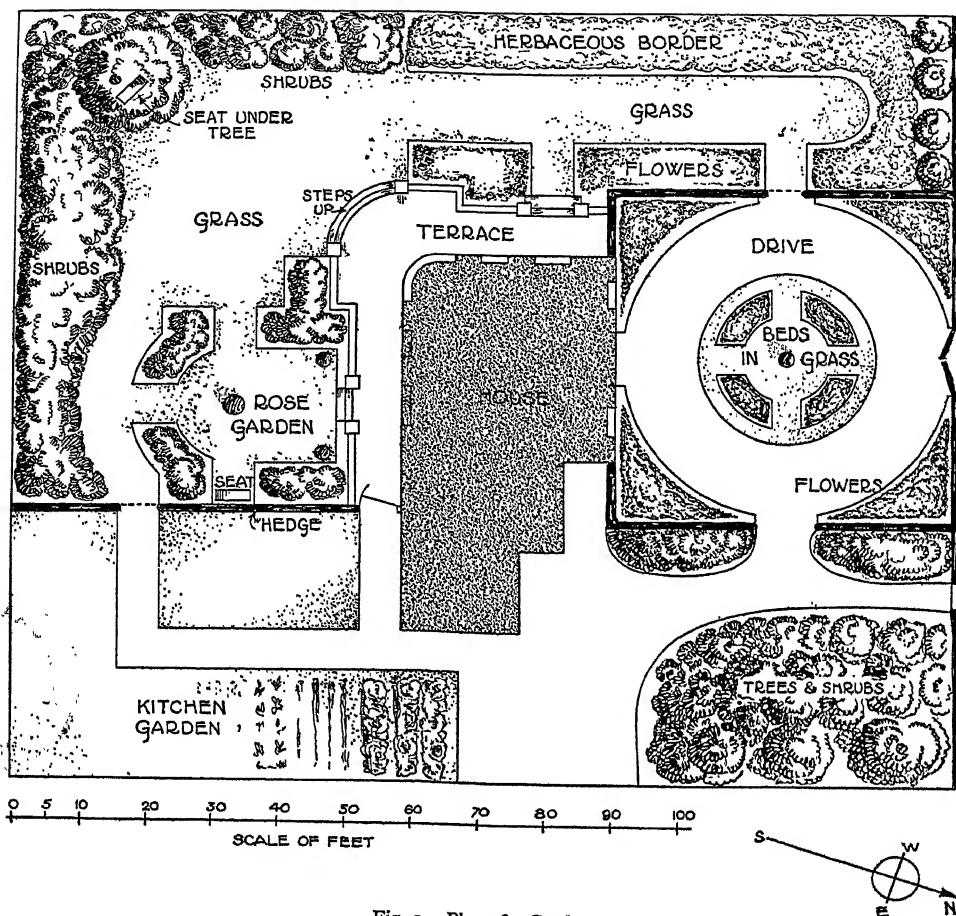


Fig. 1.—Plan of a Garden

Advantage of a Terrace

A terrace adds to the appearance of both house and garden, and if the ground is naturally slightly sloping it need not be costly to construct, as it can be made at the same time as the foundations of the house are being dug. Stone paving is undoubtedly expensive, but once it is laid it costs nothing in upkeep and has many advantages over gravel or turf for use on the terrace, not the least being that it dries so quickly that it is possible to use it almost immediately after rain.

Dry retaining walls as a support for the terrace are also an attractive feature in themselves; and, again, though they are more

expensive to make than grass banks, they cost nothing to keep up, whereas grass banks are an endless trouble and also a waste of space, which can be economized if dry walls are used. The position of the steps leading from the terrace will depend on the windows of the house, as will also the design of the garden beyond.

Aspect from Windows

Each window should frame its own picture, and each picture should be straight in the frame. Nothing is more irritating than to look out of a window and just not be able to see some object of interest that might as easily have been placed directly in front of it. A word of warning may here be given

against the misuse of garden ornaments. These should be used sparingly and with a definite object, either as a central feature to complete a garden picture, or to act as a sign-post to draw the attention to a picture beyond.

Question of Expense

It should be borne in mind by those with limited incomes, when considering initial outlay, that a little extra expense at the beginning may save a continuous drain on the purse later on, and will probably prove more economical in the long run. On the other hand, if it is not possible for financial or other reasons to carry out the scheme for the entire garden in one year, the design, once drawn on paper, can be kept and carried out gradually as circumstances permit.

Books on Garden Planning

It is not possible in this article to do more than touch on a few of the points to be considered before laying out a garden, but there are already many books written on this most fascinating subject, which may be consulted by those who wish to go further into the matter. Among them the following may be mentioned: *Gardens for Small Country Houses*, by Gertrude Jekyll and Laurence Weaver; *Gardens in the Making*, by Walter Godfrey; *The Planning and Planting of Little Gardens*, by George Dillistone; and *The Gardener's Assistant*, by William Watson.

Garden Paths

The most pleasant materials for paths are gravel, stone, and brick. The two latter may easily be laid by the amateur, and if "set dry" over a bed of sand or ashes and the interstices filled with soil, small rock plants may be allowed to grow in the cracks. Straight paths are generally best, but where winding paths are desired, some tree or groups of shrubs should be planted within the curve to account for its existence. Tar, concrete, or asphalt paths are unpleasant to the eye; they should only be used where hard-wearing considerations are paramount. Grass paths between herbaceous borders set off the flowers, but are unsuitable where there is

much traffic. Four feet is the minimum width for paths.

Wide paths and terraces give dignity to the garden; near the house a wide terrace of stone or gravel makes a pleasant sitting-place in the sunny days of spring or autumn when lawns are damp and muddy, for their paved or gravel surface is dry in a few minutes after the heaviest rain.

Boundaries

Boundaries are generally in place before the garden is planned. Walls should be carried to a height of at least 6 ft. to permit growing fruit upon them. A mellow brick wall covered with peach or pear blossom adds charm to any garden. Next in durability comes oak paling, which "weathers" a beautiful grey tint; it should never be

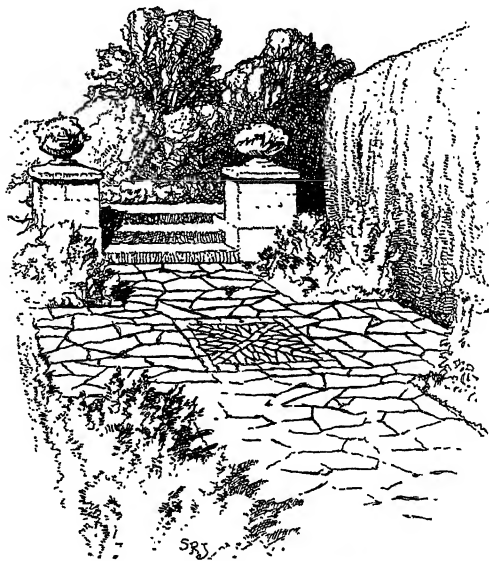


Fig. 2.—Crazy Tile Paving

painted, and though the first cost is high, it will outlast any other fencing. Deal fences painted a pleasant dark green and surmounted by a trellis covered with creepers are suitable in small gardens, while hedges made of blackthorn, cotoneaster, *Prunella japonica*, and hornbeam may be substituted

for the eternal privet, beloved of nursery-men.

Yew, holly, or privet, kept well clipped, make excellent backgrounds for hollyhocks, delphiniums, or other tall plants, but their roots take a good deal out of the soil, and a space of at least 2 ft. should be left before planting the border. Apple or pear espaliers form a pleasant division between flower and kitchen gardens, as does chestnut paling covered with loganberries or even scarlet runners. A clipped rosemary hedge, surrounding a rose garden or rock garden, is of rare charm, and will grow at least 4 ft. high. Lavender may be treated in the same way, but if kept clipped will bear but few flowers.

Lawns

Some grass is essential to a successful garden picture. Its smooth shorn surface sets off beds and flowering shrubs as nothing else can. If the lawn is to be sown, the middle of March till the end of April is the best time, or autumn sowings may be made till mid-September (see p. 16).

All grass need not be mown; some rough grass at the end of a lawn or shrubbery planted with fruit trees, with masses of bulbs growing beneath them, is always pleasant to look at, and requires no attention beyond an occasional scything after the spring glory of daffodils or anemones has passed away. The more uncommon varieties of fruit trees, such as Siberian crabs, medlars, the leaves changing to gold in autumn, beautiful *Crataegus orientalis*, dogwood, and snowy mespilus, will make this portion of the garden as attractive in autumn as in spring.

Trees for Lawns

Forest trees should not be used near the house or in small gardens; the innumerable varieties of beautiful flowering trees give far greater pleasure, and are more suitable in a moderate-sized garden. All the following may be recommended either alone or in shrubberies: the locust tree, or false acacia, bayleaved willow, may (both pink and white), almond, Siberian crab, white beam,

judas tree, *Pawlonia imperialis*, catalpa, *Arbutus unedo*, laburnum, magnolia, *Prunus pissardi*.

Sunken Gardens

To sink a square or oblong portion of the garden will often give variety to a site which is monotonous in its flatness. In such an operation the top spit must always be put aside to be replaced after the excavations are complete, but the soil that has been dug out may often be used to vary the levels still further by forming banks, which can be planted with shrubs or gorse, or these banks may be sown with grass, in which bulbs can be grown. Gardens sunk to a depth of 2 ft. or more will need retaining walls, which can be made of rubble, rough stone, or old bricks; or, in more formal gardens where an architectural effect is aimed at, brick walls with stone steps and stone copings are attractive when in character with the house. Brick or stone walls of a more informal character are better unpointed, only enough mortar to ensure stability being used. The small crevices can then be filled with soil mixed with seeds, and earth pockets contrived in which plants such as campanula, candytuft, or stonecrop will flourish.

A Pond Garden

In a sunk site a pond garden may replace flower beds. The introduction of water is always effective, and care should be taken to secure the reflection of trees or water plants on its surface. But it should be remembered that still water in the garden needs constant attention if it is not to become choked with organic matter, dead leaves, or the scum which so quickly grows on the surface of ponds. It is by no means difficult to dig ponds, their sides formed of rock or rubble, with a floor of concrete faced with cement, where water is laid on by which they may be filled; but there should also be pipes and outlets at the sides, with a plug of wood by which the outlet may be closed. In ponds, or running water, water lilies may be planted, the best method being to sink their roots in an old basket at the bottom of the pond.



THE DUTCH GARDEN, HAMPTON COURT

Conventional paths with grass clings, clipped yews and statuettes adorn this formal garden.

A Dutch Garden

A Dutch garden may be very suitably made in any small area near the house either in town or country gardens, and much ingenuity can be exercised in contriving paths of pebble or brick, set in various designs, or any mixture of stone or other paving. Hyacinths and other bulbs planted rather stiffly, wallflowers, St. Brigid anemones, pansies, violas, polyanthus, the low-growing varieties of iris, ranunculus, all rather formally planted, are suitable, by their habit of growth, for the Dutch garden, and

necessary if the formality aimed at is to be preserved.

Rock Gardens

There should, if possible, be a change of levels on coming to the rock garden; such gardens also are better placed some way from the house. A real rock garden has no resemblance to the heaps of clinker and builders' refuse, among which nothing but ivy can hope to grow, which is sometimes called a rockery. Good bold pieces of stone are desirable, and some definite contours planned where the soil is either excavated

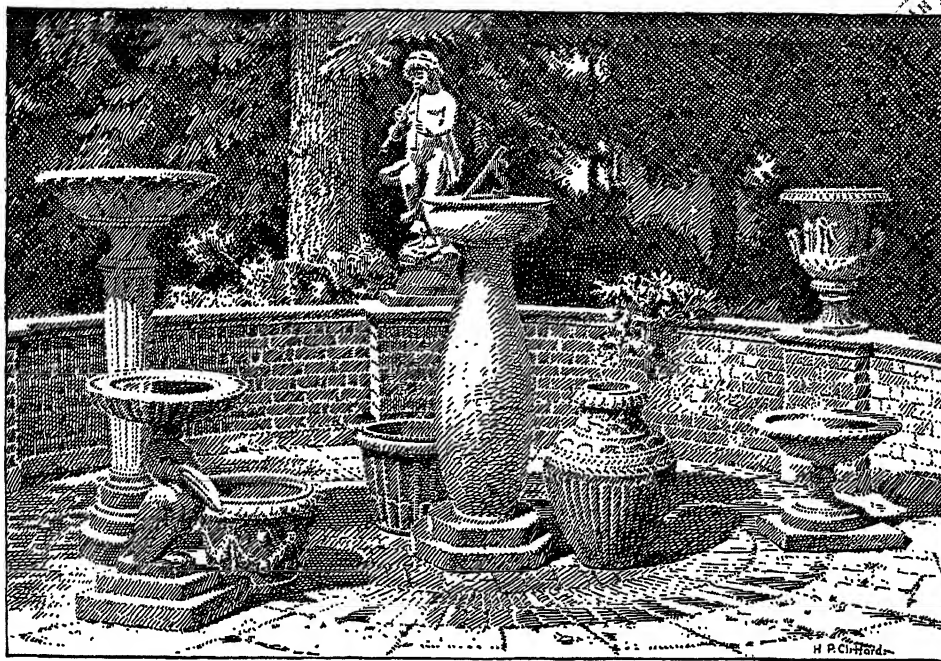


Fig. 3.—Garden Ornaments in Stone, Earthenware, and Lead

retain an effect of flatness. Standard *Magnolia conspicua* or *Magnolia stellata*, with their masses of white and pinkish-mauve bloom, may be arranged in some geometrical design which accentuates the formal lay-out of the beds. Box trees clipped into curious spirals, balls, or the figure of a peacock or some other bird, are quaint and suitable in this rather sophisticated form of garden. It will be remembered that extreme neatness in planting and in the upkeep generally will be

or undulations formed before rock-work is begun. Some artificial soil suitable for rock plants should be introduced. Many of the varieties of saxifrage, rock roses, alyssum, arenaria, daphne, dianthus, erica, iris, saponaria, sempervivum, silene, thyme, and veronica are easily grown, and snapdragon, wallflower, and sedums of all sorts, together with many primula, may form the beginning of a collection of rock plants.



Fig. 4.—Saxifrage, for Rock Garden

Planting Shrubberies

In planting shrubberies, herbaceous borders, or roses, plant in good bold masses and always aim at breadth of effect—and mass a number of shrubs at one point rather than dot them about as isolated units. An azalea bed, a bank of rhododendrons, a mass of English iris in some damp corner *tell* in a manner that the same number of plants scattered in half a dozen different beds in the garden can never do. No bed or border can be in full beauty at every moment of the year, but it is possible at all seasons to have some corner that is interesting, even in the depth of winter. A yellow winter jasmine in some sheltered spot will give much appreciated colour to the dreariest December day, and the golden bells of *Forsythia suspensa* will perform the same office in February, when nothing but the first green leaves of honeysuckle or the lamb's tails on the nut trees are to be gathered.

A group of two or three white or pink may

trees will look better than a group composed of a laburnum, a buddleia, and a lilac, while the pink blossom of the almond may make a fairyland of some grimy London backyard if four or five trees are planted together. Golden privet and elder, or other plants with auriferous foliage, are better kept together, while an avenue, however short, should always be planted with trees of the same variety.

The Ever-Tidy Garden

We are not all born gardeners. Many householders who take a pride in their homes, and cannot bear to walk to their front doors through a neglected or untidy plot, have no time for gardening, and little knowledge of plants. A garden that needs hardly any attention, and which is tidy all the year round, is their *desideratum*. For such persons nothing can be better than to concentrate on the more common varieties of iris. The typical suburban front garden may be laid out with stone or brick paths intersecting beds of white or purple iris, which, once properly planted, may remain undisturbed for years, a mass of mauve and purple beauty in the spring, and of neat-sword-like leaves all the rest of the year.



Fig. 5.—Dianthus, for Rock Garden

The iris desires nothing better than to be left alone, and will increase in beauty as time goes on; it flourishes in towns, in sunshine, or in half-shade, and cares nothing for poor soil or cutting winds. A typical front garden about 20 ft. square might have its paved path leading to the front door, the 3-ft. border beside it filled with pale-blue iris "*Pallida*"; while the centre of the garden is formed into a square bed, planted entirely with the white Florentine iris, and surrounded by a narrow stone path to divide it from a wide border following the shape of the boundaries of the plot and filled with the familiar purple of iris "*Germanica*", which will flourish under almost any conditions. Such a garden will care for itself, and the vexation of worn grass or weedy beds be entirely eliminated. A few climbing roses, honeysuckle, *Pyrus japonica*, or cotoneaster on fence and house walls may contrast their dark-green leaves with the silvery shoots of the iris.

A Sun-Parlour

The old-fashioned idea of a summer-

house was a damp and mouldering erection of wood tucked away amongst thick trees. To-day, when we spend winter as well as summer days in the open air, a summer-house is considered rather as a loggia or sun-parlour—some structure of wood, or more permanent material, contrived to catch every ray of sunshine, while it provides an adequate protection from rain and the cold north and easterly winds.

Such a summer-house should be near to the house, for convenience in serving outdoor meals, and also in a place where the elderly may sit and enjoy sunshine and fresh air. It should be sufficiently spacious to shelter garden furniture, tennis nets, croquet sets, or other garden amusements. When such a room is being built, it is as well to have the floor space as ample as possible, as the extra cost is not great and the advantages of plenty of room are many. The floor, either boarded, concreted, or paved, should be raised several inches above the exterior ground level; otherwise a heavy rainfall may flood the summer-house floor, leaving mud and dirt unutterable behind.

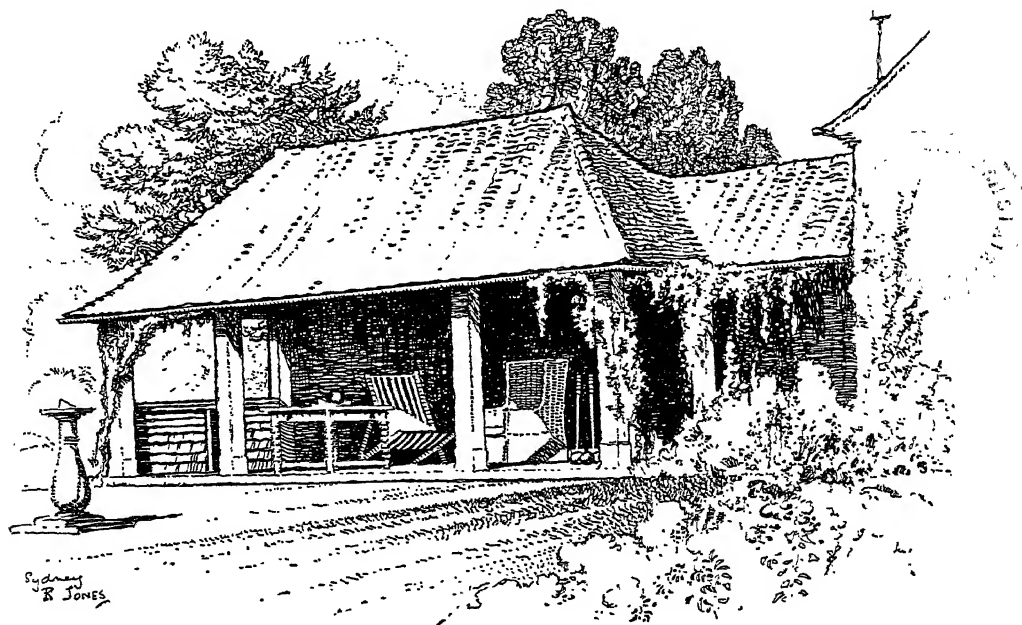


Fig. 6.—Summer-house or Loggia

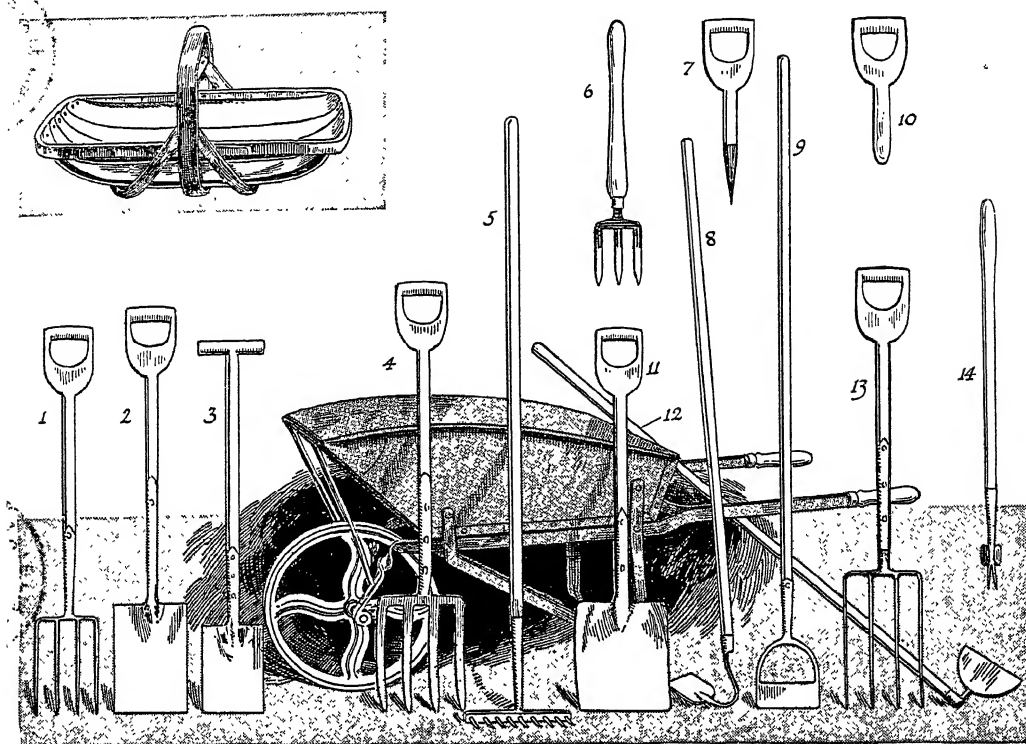


Fig. 7.—Garden Tools

1, Border-fork. 2, 3, Rustless steel spades. 4, Potato-fork. 5, Rake. 6, Hand-fork. 7, 10, Dibbles. 8, Swan-neck hoe. 9, Dutch hoe. 11, Shovel. 12, Half-moon hoe. 13, Digging-fork. 14, Daisy-grubber. A trug basket is shown at top left-hand corner.

GARDEN TOOLS

Good Quality Important

The subject of designing and planning a garden has already been considered, and the various practical operations connected with the making and upkeep of a garden must now be dealt with.

This brings us first to the question of tools required—for without the proper tools, kept in proper condition, the best work cannot be done, whether by the owner of the garden or by any professional helpers in it. Almost invariably it is worth while to spend a small sum extra in order to obtain, for instance, a strong and well-made spade or fork of properly tempered steel, of which the well-disposed weight and

carefully ground blade or tines will enable the digger to get over work with far less loss of time and energy and far more pleasure than is possible in making use of shoddy tools. The best makers have recognized this, and there is, in consequence, far less tendency now to press the sale of the old type of tool “specially for ladies’ use” or “just the thing for the amateur”.

The Spade

A good working spade need not necessarily be either enormously large or very heavy. The “D” shape of handle is generally agreed upon as most convenient (although the “T” shape is preferred by some), and the point to remember is that this handle

should be satisfactorily riveted. Twelve inches would be the maximum required for the blade, and 10 in. may be sufficient, 7 to 9 in. being a good width in proportion to these measurements. The treads of the spade, i.e. those portions on which the foot rests when thrusting into the ground, must be solid and wide enough for comfortable working.

The marks of a cheap spade are seen invariably by its back, which shows a grooved hollow instead of a solid piece where the handle joints the blade; and also by the thick edge of the blade, which does not encourage easy slicing of a stiff or uncultivated piece of land.

The Fork

It has been said that the fork will accomplish the work of almost any other garden tool. Forks in two or three sizes should be found in every well-equipped garden shed—to include various makes, from the broad-tined variety, 13 in. by 10 in. or more in size, which is equally useful for spreading manure and digging potatoes and for breaking heavy ground, to the light but strong make of “border” or “lady’s” fork, which is indispensable for aerating the soil when pressed down by hard rain or baked by sunshine, for loosening weeds, and for affording nourishment in the form of natural or artificial manure pricked in from the surface after this has been stirred with the self-same tool.

The miniature hand-fork is used for weeding and pricking up soil in the rock garden and in seed beds. Like the trowel, it should be strong and light in manufacture, with the handle set firmly in a solid back.

The Trowel

All-steel trowels may sometimes be desirable in heavy soils, but they are themselves rather heavy and also expensive. A fern trowel, by reason of its long and narrow blade, is an excellent tool for transplanting seedlings and small plants, also for bulb planting.

Dibbles

Dibbles are time-honoured tools for the

larger operations of kitchen-garden planting. They may be had either iron shod or plain, the type with a box handle (fig. 7) being perhaps the more convenient. In heavy ground, however, the amateur will be ill advised to substitute the dibble for the trowel in putting in choice plants, owing to the likelihood of their roots remaining fixed in a hole with hard-caked soil around them.

The Rake

The rake is of importance, not for initial work, but rather for removing stones and rubbish, and fining down soil with a view to leaving it in a fit condition for seed sowing. It is essentially a tool for surface employment, and is often most useful when its reverse side is drawn to and fro over the ground after the teeth have done their part for the work of preparation. An iron-toothed rake to be strong should be solid in the back like



Fig. 8.—Garden Basket with Tools

a good spade. The average 10- and 12-toothed sizes are the most generally useful, but 14 and 16 teeth are required for preparing ground quickly on the larger vegetable plots, unless a larger wooden rake is needed. A child's rake is often of greater use than might be supposed in cleaning small surfaces, e.g. where the sowing of masses of annuals between permanent plants is concerned.

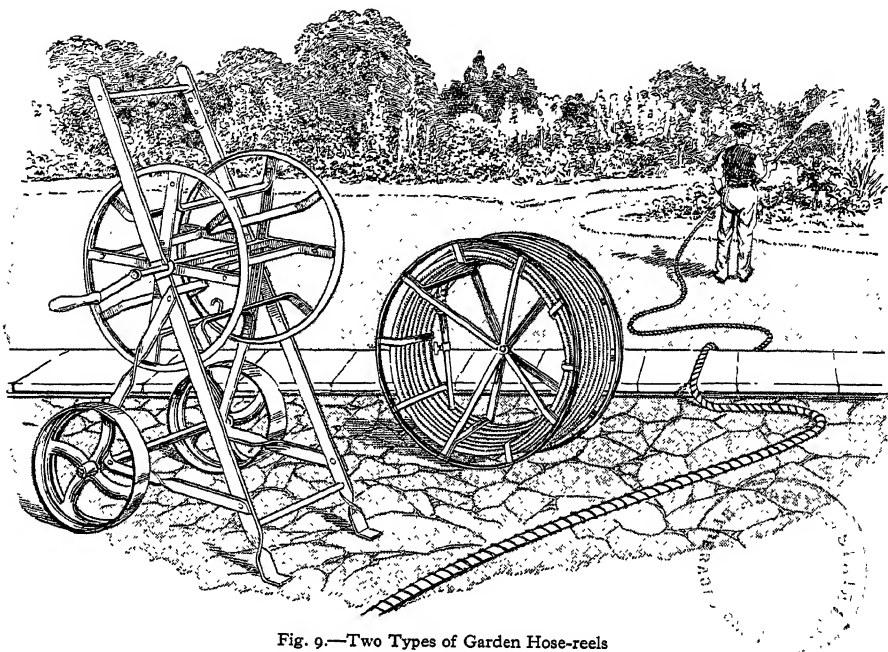


Fig. 9.—Two Types of Garden Hose-reels

Hoes

Hoes are of various kinds, one of the main types being the Dutch hoe, used for chopping weeds and loosening soil with a pushing movement, the operator walking backwards meantime. Various swan-necked (fig. 7) and other types of draw-hoe serve usefully for the skimming action of cleaning beds and for that of weeding paths. The corner of the draw-hoe, which catches a noxious plant at its collar when weeding, has for one of its chief functions the drawing of seed-drills. For the last function, however, a hoe of triangular pattern is specially obtainable.

Home-Made Garden Line

The garden line is often wound upon a home-made frame made of two cross-pieces of wood (revolving or fixed), but a good-sized kitchen garden will usually possess the orthodox iron reel and stake, which needs no further mention here.

Truck Basket and Barrow

The practical usefulness of the Sussex

trug or truck basket is likewise too well known to need further description. It will be supplemented by larger baskets for holding rubbish and also garden stock of various kinds, which bring us finally to the mention of the wheelbarrow. While it is true that some fairly good barrows are to be had both cheap, good, and reliable, it is a great advantage to be able to invest in the very good article which will last a lifetime—strong, yet not too heavy, and like a good spade as regards the right *disposition* of its weight. It will be a matter for consideration whether the type chosen will be a box-barrow or a stable or “general purposes” barrow—both of which are to be had with removable back and adjustable top-frame for leaf sweeping; &c.

The writer much prefers the stable-barrow type as being less cumbrous for general purposes. An ordinary navy barrow, if not too open, is a cheap substitute which will not serve too badly in small gardens, although its iron wheel is a disadvantage. Barrows are greatly preserved by a coat of paint being given to them at the beginning

of their career; and it is a pity to expose them, or indeed any garden appliance, to inclement weather at night if shelter can be found in the shed or lean-to, failing which the barrow should be turned upside down to prevent as far as possible its retaining moisture.

Lawn Mower

The two chief types are the chain-driven and the gear-driven, the former possessing certain advantages for use by amateurs. English machines have several knives under the barrel and a strong cutting blade underneath. Screw adjustments regulate the depth of cut, and raise or lower the back roller. Machines fitted with few knives are apt to leave ridges when cutting grass which is at all uneven. Strength and lightness are the two characteristics of the best mowing machines. All reliable machines are to be had in sizes varying from 8 to 16 in. cut. For the light hand machine suitable to a small lawn, 10 or 12 in. may be found suitable. Machines fitted with ball-bearings run very smoothly.

An edge-cutting appliance can be fitted to the machine, and the extra cost will be quickly balanced by the economy effected

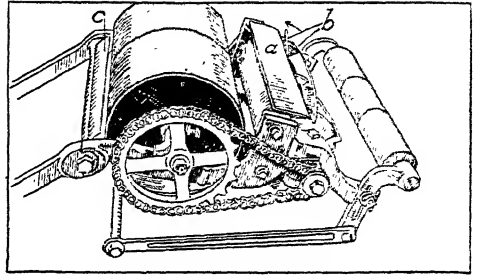


Fig. 10.—Under Side of Lawn Mower showing Cutting edges

a, Fixed blade. b, Revolving blades. c, Knife for cleaning grass from rollers.

in labour. Amateur gardeners are strongly recommended to study the instructions sent out with the mowing machine purchased, more particularly with regard to the oiling and general care of their machine.

Garden Roller and Hose

A double-cylinder roller is much the best for even a small garden, as it can be turned more easily than the single-cylinder type. The question of weight is best settled by saying that the roller chosen should be one which can be drawn or pushed with comparative ease. The bearings should be accessible for oiling. Single-cylinder rollers

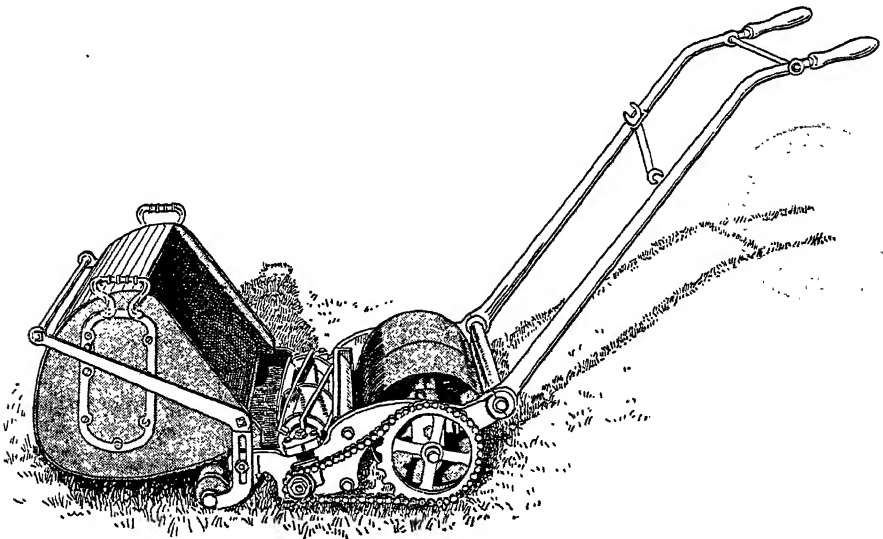


Fig. 11.—Green's Lawn Mower

made of cement or stone have lately become popular and appear to give satisfaction.

Lastly, a good quality rubber garden hose

will be required, with hose reel. Care must be taken never to knot the hose, and it should be kept in a dry—but not hot—place.

THE SOIL AND ITS COMPOSITION

Composition of Soil

It must be recognized that some very slight knowledge of the composition and behaviour of soils is necessary to all who wish to garden with intelligence. For practical purposes, soil may be described as powdered rock, which has in the first place been worn away by the weather, and further influenced by, and mixed with, portions of plant and (later on) of animal life.

If sand predominates over clay, the soil will feel and appear gritty and open. A sandy loam presents certain advantages in winter, as it is workable throughout nearly all bad weather, suits many plants which dislike damp and cold, and forms a good medium for striking cuttings, planting out delicate seedlings, &c. But a clayey soil, on the other hand, will win the day for all-round usefulness. Although a harsh and even death-dealing medium to some plants in winter, it will withstand drought in summer when sandy soils are the despair of gardeners in possession of these.

Loam and Clay Soils

It is not possible to deal in this article with the elaborate processes which contribute to the make-up of sand, clay, limestone, and peat; but the soils which principally occur in gardens invariably show a preponderance of one or the other. Sand and limestone are too familiar in appearance to need description. Where clay and sand are present in almost equal proportions, the soil is known as loam. Loam is the typical soil of good meadow land, enriched by the gradual rotting-down of grass and leaves, by the manure of farm animals, and by the decay of small animals' bodies (such as worms) and of other organic life.

A stiff clay soil might be more difficult to

grow crops upon than a sandy one *if it were not carefully treated*. This treatment consists in deep cultivation, which will be described presently, and at the same time in introducing the right ingredients to lighten and improve the soil and to make it easier for the moisture to pass up and down.

Value of Humus

The material which—curiously enough—has an equally good effect upon both clayey and sandy soils, lightening one and giving more “body” to the other, is *humus*. Under this name are included generally a number of animal and more still of vegetable substances—roughly speaking, of all organic matter in soils. An excess of humus, and more particularly of that form of vegetable soil known as *peat*, would be deleterious to all plants except those of a very special character, unless such soil be kept under thorough cultivation and its acidity neutralized by combining *chalk* or *limestone* with it.

Comparative Value of Soils

Conversely, a chalky soil needs the plentiful introduction of vegetable matter, and in addition it should possess a good deep surface for cultivation; for layers of chalk too near the surface would give the reverse of the medium as a rule desired. It is, however, most important to realize that a sufficiency of chalk or lime is essential to the fertility of soils; and if lacking, this must be supplied artificially. It is safe to say that all soils rich in clay or humus or both will be benefited by a good dressing of lime every two or at least every three years. For small gardens lime may be had in bags ready slaked and prepared.

While clay soils are found to be exceedingly cold in texture owing to the moisture being retained by the sticky “*alumina*”,

THE LAWN: ITS MAKING AND CARE

Turf or Seed?

As regards the question of lawn making, the merits of turf versus seed will probably be discussed by their respective supporters so long as gardens exist and lawns require to be laid. To dismiss the question briefly, it may be said that while turf is supposed to have the merit of being ready for play and all other purposes in the shortest possible time, this advantage can hardly be insisted upon if the right means are taken with seed, so long as they extend both to the proper preparation and the right after-care. Turf, although useful for patching a lawn which has suffered by accident or wear and tear in mid-season, is very difficult to obtain of the desired quality unless a "nursery" of lawn turf be kept always growing in some part of the garden, which precaution is hardly likely to be a practicable one.

Seed and Soil

In ordering the seed it is well, if an expert cannot be consulted on the spot, to send proper samples of the soil to one of the several firms from whom the seed can be ordered, and be guided by their advice as to suitable mixtures and other matters of individual situation. The position chosen should be an open one (for lawn grass will not flourish under trees); and if the ground be poor, it should be dug to a depth of at least 18 in. or 2 ft., and enriched with farmyard manure or the most retentive manure which can otherwise be obtained.

Levelling

The most level situation will naturally have been chosen when the garden was planned (see *Garden Planning*, p. 20), so as to avoid carting of soil from the highest to the lowest part of the ground, as will otherwise be necessary. If the soil has been noticed to lie wet in winter, it may require draining by laying pipes 3 in. wide at a depth of 2½ ft., the average distance of the rows of pipes being 12 ft. apart. Whether

turf or seed is going to be used, the ground will require, after draining, to be rendered (by ramming and rolling) firm enough to ensure a good level foundation at the start.

If turves are laid, they should be obtained from a reliable firm who will supply those of a good quality, eliminating coarse grasses. The measurements of these turfs will be, as usual, 3 ft. long by 1 ft. wide, by 1 or 2 in. thick. They are kept rolled up while the lawn is in process of laying, and as each turf is put in place it is rammed level with its neighbour, any cracks being afterwards filled in with a good dressing of fine soil.

Season for Sowing

In the other case, i.e. that of making a lawn from seed, the ground should be allowed more or less time (according to its texture) to sink and settle, and favourable conditions be then chosen when the season for sowing arrives. Many experienced gardeners advise early autumn for this; and it is true that it gives opportunity for the lawn to be weathered and its surface constitution rendered—as it were—robust, before the wear and tear and hard play of a summer season supervenes. The rains and heavy dew which usually mark the break-up of summer weather will do much towards the satisfactory consolidating of turfs, just as they will be a help to quick germination of the grass seeds.

Nevertheless, spring sowing of grass seed is more usual where lawns are concerned, and the months of March and April—following on good winter preparation—are best for the work, April being often preferable for the North and Midlands.

Rye Grass

For soil which is at all heavy or clayey in texture, the mixture chosen is best mixed with rye grass. This question will be decided in advance when samples of soil are submitted. Very light soils, or ground for special purposes, may be sown with a mixture devoid of this ingredient, which is of a robust character and calculated to resist hard wear.



Photograph by E. Wallis

A ROCK GARDEN

All kinds of tiny rock plants blossom here each year, and water lilies are placed in the pond.

Quantity of Seed Required

Many amateurs have been slightly puzzled as to measuring up the ground they desire to sow. If a new lawn is to be made, 1 oz. to the square yard will be correct, i.e. 1 lb. of grass seed to every square containing 16 sq. yards. Half or a quarter of this quantity may be used to renovate old or worn-out turf, whose preparation for the operation will be described further on. For convenience' sake in sowing the turf evenly, divide the ground into squares of 4 yards by 4 yards, and then proceed to perfect the level so far as is possible by raking and cross-raking with an iron-toothed rake.

How to Sow

Seed should be sown on a still day, with bent back to avoid its being blown away. The surface of ground should have been sufficiently disturbed by raking for the seed to fall easily into place; but in order to cover it thoroughly, it is most desirable to have ready a quantity of fine, light, sifted soil sufficient to cover the seeds to a depth of $\frac{1}{4}$ in. This soil will be distributed by gently tipping spadefuls from side to side, and a fresh and thorough raking will then be proceeded with. This raking and cross-raking should distribute the seeds quite evenly over the surface sown, and it should be followed by rolling with a fairly light garden roller.

Protection from Birds

The town sparrow is the principal offender where lawn grass is concerned, and he flies successfully over most forms of snare. Grass seed may be steeped before sowing in a patent preparation sold for the purpose. But as birds do not really enjoy a serious effort to entangle their feet, it is probable that the time-honoured system of stretching cotton across small stakes will prove the best deterrent. Lengths of old netting may be utilized where available, or twiggy branches be laid over the turf, but they are not very likely to be so effective as the stretching of black cotton.

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Use the Mower

Within the space of ten days to three weeks the lawn grass will be well "up", and it must not be allowed to become lanky before submitting to the strengthening influence of the mowing-machine. The young grass must therefore be cut when it has not attained a length of more than 2 in., and to do this well, the knives of the machine must be set rather high. See that the mowing-machine is in the best possible condition when used for cutting young and tender grass; if found to be rusty or choked with old grass and soil, it should be thoroughly cleaned before using, removing such nuts and screws as are seen to be easily detached. The body of the machine may be swilled

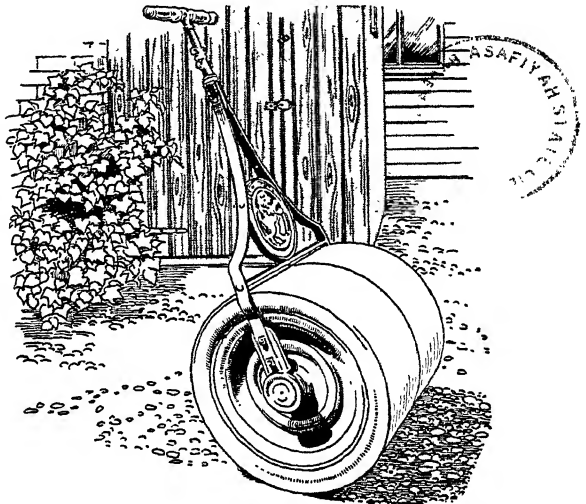


Fig. 13.—Garden Roller

under a tap if necessary, and the parts stiffly brushed over, using hot water for choice. When thoroughly dry, the parts should be well oiled with proper mowing-machine oil, containing a good proportion of soft lubricant mixed with paraffin.

All the knives should be covered with a thin film of the oil, and screws, nuts, and bolts will, of course, receive a drop each from the oil-can. Excessive oiling must be guarded against, however, for the lubricant mixing

with soil and dust would be apt to clog the parts and so defeat its own purpose.

Rolling

Contrary to what might be supposed by the uninitiated, the growth of young grass is encouraged by rolling. This is because the pressure exercised causes the roots to spread, while it also stimulates the top-growth in response to the resistance of the roller. It is, of course, a fact that the superiority of our older English lawns, which are the envy of other countries, is the result of centuries of rolling and mowing, combined with the application of suitable food elements in their season.

Fertilizing the Lawn

The latter point—that of feeding the grass properly—can hardly be too much insisted upon, for the starvation of the English lawn is one of the commonest, albeit one of the most illogical, features of English gardening practice. It is absurd to shave the lawn closely each week and to throw the mowings on to the compost heap without some effort being made to replace by degrees the means of nourishment of which the grass has thus been deprived. Suitable food and stimulants for a lawn will vary according to the texture of the grass and the time of year.

For general feeding purposes sifted soil with some finely shredded manure from the heap will be found admirable. The soil used should contain by preference two parts of meadow loam to one of leaf-mould (oak or beech); but an occasional dressing of "spent" soil from the potting-shed will be found of great benefit, especially if mixed with wood ashes or soot.

Dressings for Lawns

No such dressing should be relied upon without supplementing the natural food supplied. This should be done with phosphate and potash (see recipes below), since lawn grass, like other "vegetables", desires to be encouraged in flowering, in order that it may reach its natural strength and maturity. It requires also still more strength and encouragement to produce blades of

fine quality—and quality is the special contribution of *potash* in no matter what section of garden cultivation. Spring is the time above all others when stimulating food is required, but in the hard and trying days of high summer also the welfare of the lawn must not be forgotten. It is a good thing to cut the grass without a grass-box occasionally in summer time, in cases where the grass can be left on the surface for a few days before sweeping up.

Good Recipes

Good recipes are given in the *Chemistry of the Garden* by a practical expert (Mr. H. H. Cousins) for lawn dressings to be applied as a general stimulant on lawns required for tennis, &c.

In November { basic slag, 3 lb. } per 40
 { kainit, 2 lb. } sq. yards.

In March { superphosphate, 3 lb., } per 40
 { nitrate of soda, 1 lb., or } sq.
 { sulphate of ammonia, $\frac{3}{4}$ lb., } yards.
 { or rape dust, 4 lb. }

N.B.—If nitrate be used it must be supplied separately.

Another dressing recommended by the same authority for lawns where clover is not objected to is the following:

Basic slag, 5 to 8 lb. } per 40 sq. yards.
Kainit, 2 to 3 lb. }

N.B.—The latter dressing is obviously unsuited to lawn tennis courts, since clover is too slippery for play and stains the balls.

General Care of Lawns

The timely removal of all plantains, dandelions and other weeds is naturally of special importance on a lawn used for play, and comes second only to rolling and mowing. Patient weeding by hand will secure the suppression of the enemy where too great hold has not been obtained; holes left by the roots being removed should be filled up with soil to preserve the lawn level. In case of neglected turf, those parts of the surface which have become covered with weeds or moss should be very heavily scratched with an iron-toothed rake, and the surface afterwards covered with seed and fine soil.

The effect of weed killers of the type

known in the trade as "Lawn Sand" is to burn the weed as it stands; and although this method causes unsightly patches at the start, eventually the grass benefits by the formation of a solution of ammonium sulphate, which, of course, nourishes the roots of the grass itself.

Sweeping of Leaves

The final care of the lawn consists in the work of sweeping. This operation should be carried out regularly so soon as leaves begin to fall, for it is fatal for leaves to collect and after becoming sodden with autumn rains to linger on the grass. Take a long reach with the arm and sweep briskly the length of the lawn, dividing into as many breadths as convenient. As the heaps become large enough, lift with a pair of boards (called "gardeners' hands"); these will be made at home by sharply bevelling

the edges of a couple of thin pieces of deal, each about 15 in. long by 6 in. wide, small strips of wood (to act as handles) being fixed in the centre of the boards at right angles to their surfaces.

The regular and energetic sweeping of grass can be relied upon to improve its health and texture, more especially because it aids considerably in the spreading of the roots and consequent encouragement of top-growth.

Tennis Lawn

Lawn tennis requires a level lawn of the dimensions given in the plan, with a margin of at least 6 ft. beyond the lines for the run-back. In a small garden it will be necessary to provide high boundaries to prevent the balls from going over walls or fences. A tennis lawn must always be kept well turfed, well mown, and well rolled.

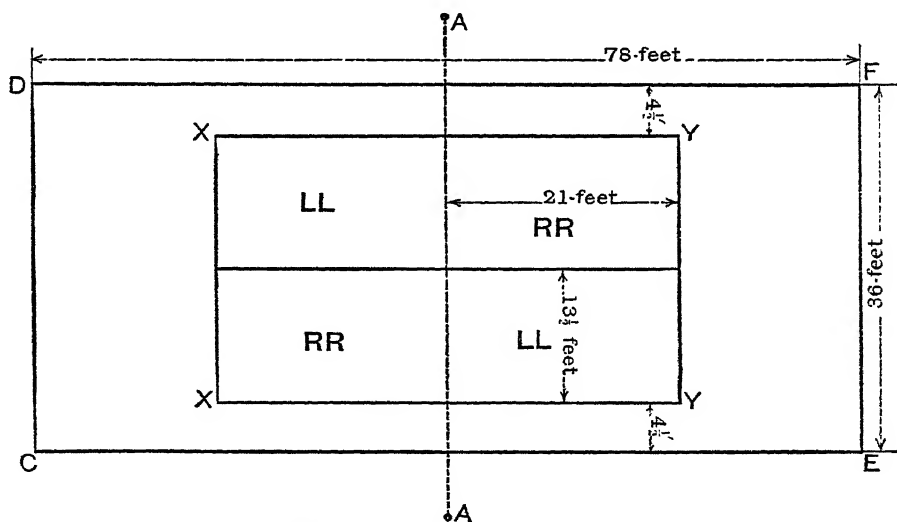


Fig. 14.—Plan of Full-size Tennis Court

AA, Net. CD, EF, Base lines. XX, YY Service lines. XY, XY Service side lines. RR, Right courts LL, Left courts.

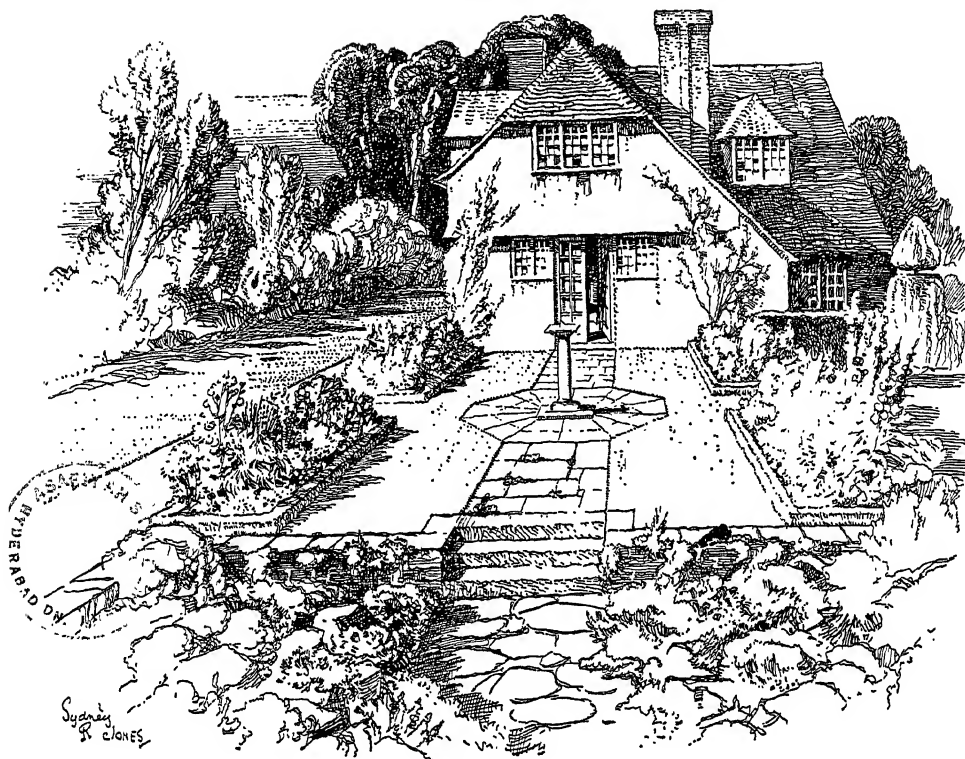


Fig. 15.—A Well-designed Flower Garden

PLANNING THE FLOWER GARDEN

The subject of the flower garden in relation to the home is such an enormous one that a few suggestions only can be offered here. To reproduce complete lists of all the best plants to grow would likewise be an impossibility, for modern horticulture, although it has failed to eliminate much that is not worth growing, is continuously increasing and improving the best varieties of flowers to an almost unbelievable extent.

The flower garden proper comprises that part of the home grounds more immediately surrounding the house itself. In considering such surroundings we think naturally of the garden walks, the lawns with (as a rule) their surrounding trees and shrubs, the formal flower beds, possibly a rock garden and a water garden, generally some dry-walling,

perhaps even a small wild garden and some woodland planting. But whatever has to be omitted by the owner, for lack of space, time, or money, one or more main flower borders—chiefly composed of the best herbaceous plants—and the planting of some really good shrubs and trees, will certainly be included in the simplest scheme.

Shade Trees

There are perhaps few subjects of horticultural interest upon which less wise thought is expended than the subject of shade trees for planting in different types of gardens in England. A point which is apt to be forgotten concerns that of the size and habit of forest trees, which are too often planted in streets and in small town

gardens, where they are either butchered by the "jobbing" type of gardener until all grace of form is destroyed, or they are left unrestricted altogether to encroach on the possibilities of the garden intended for flower growing, as well as upon the need for allowing sunlight and air to penetrate to the dwelling-house.

It is a great pity that shade trees and shrubs in town gardens should be limited to non-flowering trees and to the commoner evergreen varieties of shrub such as laurel and privet. Not that the latter are seen at their best even in the country; but in how many towns do they constitute almost the only garden ornament, and even then they must generally belie their name by being "evergreen"—because of the soot and smoke which constantly cover them.

Flowering Trees

Whether there is a small space for a single specimen or a background to fill up, flowering trees are worth far more attention than they usually receive. Hawthorn (white and red), horse chestnut, lilac, laburnum, and mountain ash will grow almost anywhere, even in smoky air. The common dark green holly usually thrives in any soil or place, but the variegated sorts need favoured positions. Magnolia Yulan does best in a warm spot. The flowering currant (*Ribes sanguinea*) grows well in damp places. The strawberry tree (*Arbutus unedo*) appreciates a seaside situation, also one where there is plenty of lime in the soil. Cherry, almond, plum, peach, *Pyrus floribunda* and *Pyrus spectabilis*, also the Robinia (*Pseudo-acacia*) deserve a place, and their spring beauty may be enhanced by spreading beneath them a carpet of bulbs, as is seen in full beauty at Kew Gardens—where all garden-lovers may learn to know how some of the best things are done in spring.

Among shrubs, in addition to those already mentioned, the following should be noted: Portugal laurel, cotoneasters, brooms, including *Cystisus andreanus*, magnolias, althæas, heaths, azaleas, rhododendrons, acers in variety (maple), spiræas, and *Hydrangea paniculata*.

Flowering Trees and Shrubs

The following lists may be said to represent the result of sound experience in planting on the right lines for gardens of various types. Fuller lists may be sought in the works of the late Mr. E. T. Cook and his collaborators, to whom the writer has been indebted for some stimulating suggestions.

Deciduous Flowering Trees:

Almond.
Snowy Mespilus (*Amelanchier canadensis*).
Cotoneaster frigida.
Thorns (double rose and double scarlet *Cratægus*).
Laburnum.
Magnolia conspicua.
Double Wild Cherry (*Prunus Avium flore pleno*).
Prunus cerasus.
Pseudo-cerasus Watereri.
Pyrus (*Malus*) floribunda.
Pyrus floribunda flore pleno.
Pyrus spectabilis.
Pyrus coronaria.

Trees and Shrubs with Conspicuous Bark in Winter:

Birch (*Betula alba*).
Betula populifolia.
Dogwood (*Cornus alba*).
Ash (*Fraxinus excelsior aurea*).
Rubus biflorus (with quite white stems).
Golden Willow (*Salix vitellina aurea*).

Trees and Shrubs with Beautiful Fruit:

Arbutus unedo (Strawberry Tree).
Berberis.
Cotoneasters.
Thorns in variety (*Cratægus*).
Spindle Tree (*Euonymus europæus*).
Euonymus latifolius.
Sea Buckthorn (*Hippophaë rhamnoides*).
Holly in variety.
Pernettyas in variety.
Sambucus racemosus.
Skimmia oblata and others.
Snowberry (*Symphoricarpos racemosus*).
Wild Guelder Rose (*Viburnum opulus*).

Weeping Trees and Shrubs for Lawns and Elsewhere:

Birch (*Betula alba pendula*).
Betula alba Youngii.
Beech (*Fagus sylvatica purpurea pendula*).

Ash (*Fraxinus excelsior pendula*).
 Holly (*Ilex aquifolium argentea pendula*).
Ilex aquifolium pendula.
Ilex aquifolium pendula aurea.
 Pine (*Picea morinda*).
 Poplar (*Populus grandidentata pendula*).
 Populus Parasol de St. Julien.
 Willow (*Salix babylonica*).
Salix Caprea pendula.
 Yew (*Taxus baccata Dovastoni aurea pendula*).
Taxus baccata pendula.
 Elm (*Ulmus montana pendula*).

Evergreen Flowering Shrubs for Small Gardens:

Azaleas, hardy.
 Berberis Darwinii.
 Berberis stenophylla.
 Ceanothus azureus Gloire de Versailles.
 Escallonia macrantha.
 Escallonia Phillipiana.
 Kalmia latifolia.
 Privet (*Ligustrum sinense*).
 Olearia Haastii.
 Rhododendrons in variety.
 Laurustinus (*Viburnum Tinus*).
 Yucca recurvifolia.

Shrubs suitable for Planting under the Shade and Drip of Large Trees:

Berberis aquifolium.
 Box in variety.
 Dogwood (*Cornus*).
 Cotoneaster microphylla.
 Daphne laureola.
 Daphne pontica.
 Gaultheria Shallon.
 St. John's Wort (*Hypericum calycinum*).
 Ivy in variety.
 Phillyrea media.
 Butcher's Broom (*Ruscus*).
 Snowberry (*Symphoricarpos racemosus*).
 Periwinkles (*Vincas*).

Need for Thinning Out

Among other important points which must be considered in the use of trees and shrubs, is their size and the distance of planting apart. Often, after a group of trees or shrubs has been planted, it is left for years without either pruning or thinning, whereas in all probability two-thirds of the trees themselves, and later on, two-thirds of the growth of the specimens left, should certainly be removed to make space for the proper development of the plantation.

Pruning

As regards the pruning of ornamental trees of the larger types, this will depend almost entirely upon the two considerations of health and shapeliness.

Shrubs which set their flower-buds in the previous autumn, and thus prepare for blooming in the early spring and summer, should be pruned just after their flowering season is past. Lilacs may, if possible, have their suckers removed in winter and the weak shoots cut back in June if these are too tall and crowded.

Such shrubs as Mock Orange, Guelder Rose, Weigelia, and Deutzia should have their flowering shoots cut back after these have finished flowering, or the lower shoots left unpruned, while those which are too tall must be cut back a considerable amount. Those shrubs which bear flowers on young wood made during the current summer may be cut back at any time between November and March. Among these are some of the ceanothuses, Japanese spiræas, and others of that class, honeysuckles, jasmines, *Buddleia variabilis*, *Colutea*, *Hydrangea paniculata*, &c. In the case of *Hydrangea hortensis* as distinct from *Hydrangea paniculata*, it must, of course, be remarked that the treatment is different; the flowering shoots may be cut well back after they fade, but the

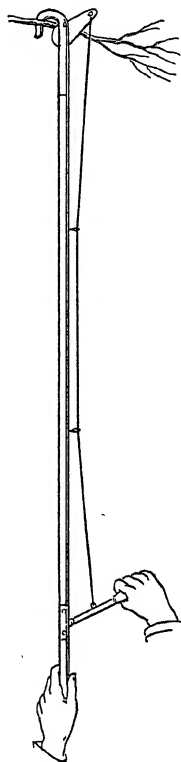


Fig. 16.—Tree Pruner

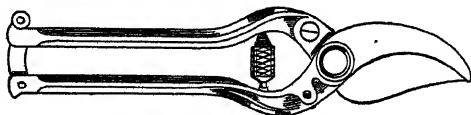


Fig. 17.—Plant Pruner

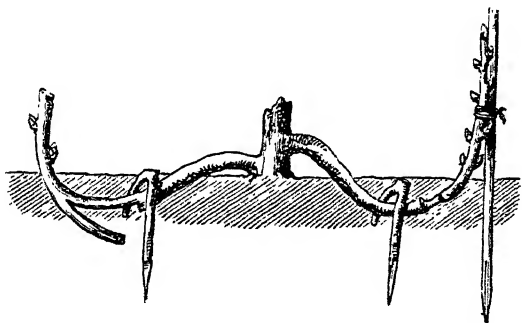
flowerless ones be left without pruning.

Flowering currants, *Prunus triloba*, Forsythias, *Spiræa Thunbergi*; also the varieties *prunifolia* and *canescens*, should be pruned in April, either earlier or later when flowering is finished.

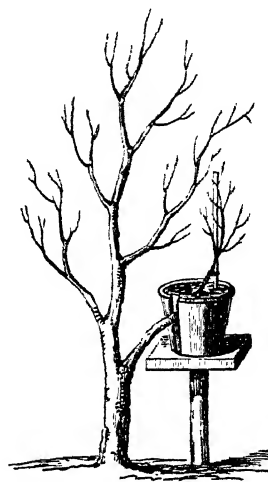
Ornamental subjects, such as the almonds, double cherries, and flowering crabs, may be pruned as little as possible, only cutting out and trimming where necessary after the flowering is over. May-trees are apt to become a thicket of growth, and this growth should be drastically thinned from time to time.

The commoner kinds of evergreen shrubs—e.g. laurels and hollies—may be pruned, generally speaking, during the winter

by cuttings is not easy. Evergreen shrubs are frequently treated in this way, notably rhododendrons, also such subjects as the clematis. If a low-growing branch comes naturally in contact with moist soil—as is seen in nature—it will often emit roots. To secure this condition, therefore, make a slit half-way through the stem in an upward direction, and fix the cut portions apart (e.g. with a small stone) to prevent closing. When roots are properly formed, the new plants may be detached and begin their independent existence.



Layering by pegging down



Layering by Circumposition

Fig. 18.—Layering

months; and all evergreens requiring this treatment should have their straggling shoots shortened during that season. *Berberis stenophylla* and *Berberis Darwinii*, *Choisya ternata*, and rhododendrons, are examples for this practice, which should prevail more frequently than it does as a rule in English shrubberies.

For pruning work of all kinds, a good pruner may be used, but it is best to treat the smaller and more delicate stems and branches of shrubs with a well-sharpened knife.

Layering

The propagation of hardy shrubs by layers is largely practised where increase

In layering, as in making hard-wooded cuttings, it is advisable to remove those buds which are not required to form shoots, i.e. between the tip and the portion it is desired to encourage to "callus over", in order to produce those cells from which the new roots will eventually develop.

Layering may, of course, be used in certain cases for the increase of soft as well as hard-wooded subjects. Of this method of pegging down, the typical example is the carnation, which has been found to succeed better by such a method than by making cuttings.

Hard-Wooded Cuttings

Cuttings should be taken from bushes in

good health, and the wood be in a half ripened state as a rule; allow a length of from 4 to 12 in., according to the subject dealt with. Remove all leaves except three or four at the top, and make a transverse cut straight and clean below the last node (dormant bud) upon the stem chosen. Have ready a bed of fine soil with plenty of sand, in an open position if in late autumn, or in a sheltered and shady one if the cuttings are likely to suffer by wilting in sunshine. Stretch a line across the bed and dibble the cuttings in very firmly, burying the greater part of their length—even up to the lowest leaves, in the case of short cuttings such as ivy and euonymous. Cuttings placed under a hand-light, well shaded, and kept moist but by no means wet, will strike more quickly than will those out of doors.

The usual method of striking heaths, azaleas, and other so-called American plants, is to place them in small pots of sandy soil in a shaded frame in the greenhouse itself. Gooseberries, currants, and raspberries may be struck with great ease out of doors in October and early November, and transplanted either as soon as rooted or as soon as spring arrives.

Creepers and Climbers

Ampelopsis Veitchii is by far the most easily-grown climber for planting to run rapidly over a building and train itself. Virginian creeper is beautiful in autumn, but requires training. For an east or north wall, plant *Jasminum nudiflorum*, Cotoneaster, *Pyrus japonica*, Escallonia, *Crataegus pyracantha*, and a Morella cherry. The hardier varieties of Clematis may also be thoroughly recommended; while on a south or west aspect, Bignonia, Wistaria, Passion-flower, many varieties of Clematis and Honeysuckle, also white and yellow Jasmines flower freely. *Solanum jasminoides* is a beautiful creeper for planting in the south; some of the Ceanothuses, *Forsythia suspensa*, and, in the warmer districts, *Ceanothus puniceus*, are suitable for walls with a south aspect.

Roses are, of course, most beautiful climbers. Against a south wall, plant Maré-

chal Niel, Gloire de Dijon, Cheshunt Hybrid, Devoniens's, and some of the best ramblers, such as William Allen Richardson and Noisettes; against a north-west wall, Dundee Rambler and Félicité Perpetuelle; and against an east wall, Gloire de Dijon and Cheshunt Hybrid. It must be borne in mind, however, that roses will not grow everywhere, and in smoky places and some parts of London it is not advisable to attempt their cultivation.

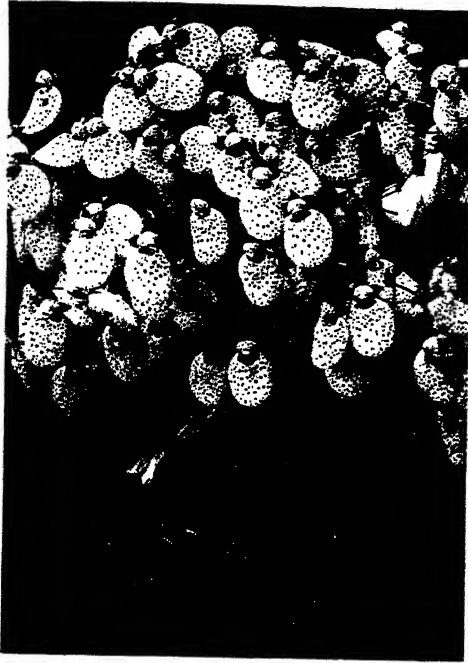
Creepers and climbing plants may often be turned to good account in dividing the flower garden from the kitchen garden grounds, although, for the more serious divisions, hedges of box, yew, or *Cupressus Lawsoniana* will be chiefly utilized.

The Mixed Flower Border

The main flower borders should provide pleasure in the garden from June and early July till late October or November. It is far better, if possible, to see them providing a really beautiful effect during a definite period, than merely to show isolated spots of colour from February to December. It must be understood, however, that even such a continuous effect as is here suggested requires a little judicious planting to fill up gaps with successions of annuals, and even the dropping in of plants raised in a greenhouse to take the place of flowered-out specimens as each season passes by.

If, however, one main flower border only is possible, the display may be prolonged from May till November, involving, of course, a greater outlay of both labour and expense.

Where it is possible—as good gardening ideals should make it—to devote different parts of the garden to different seasons of the year, the most sheltered part of the grounds will be devoted to spring flowers. Miss Jekyll has given an unforgettable example to those who know her garden of “Munstead Primroses” (or have seen pictures of it in her books); and a little later in the season she has shown us what can be done by the use of the best kinds of Italian and other irises. Later, again, the same great artist-gardener has suggested the true use of the



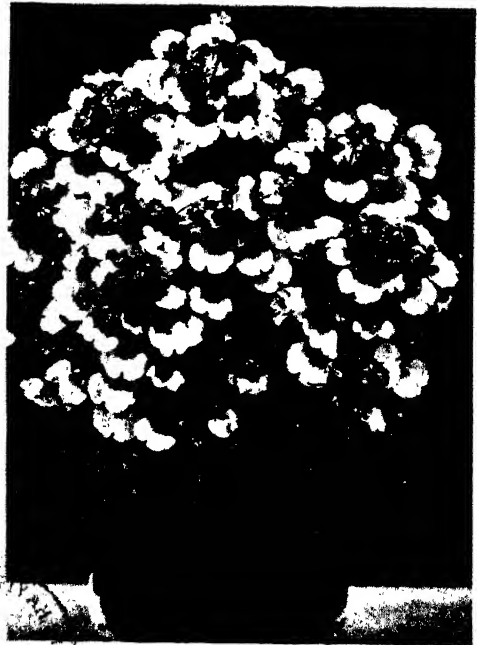
Calceolaria



Schizanthus



Statice (Everlasting)



Nemesis (Aurora)

GARDEN FLOWERS

By permission of Messrs. Sutton & Sons

Michaelmas Daisy in such a way as to give the most satisfying results in autumn—wonderful in their combination of the best modern types and ranging from the feathery “Delight” through the rose of “Combe Fishacre” and the pale mauve of *Aster acris* to the deep purple of *Amellus Riverslea*.

The Colour Scheme

The question of a colour scheme for the principal flower border should be considered in most serious fashion, and the scheme should be drafted first upon paper, numbering the spaces upon a rough plan and providing with it a key for reference (fig. 20). Low-toned colours will predominate at the west end of the border, that is, the flowers and foliage should give an effect of white and glaucous-green merging into pale yellow in order to provide the proper foils for the masses of pure blue farther on. (See Sections 1, 2, and 3, Nos. 1 to 20.)

The pale pink tints will be introduced by degrees to mingle with, and follow after, the blue; and after the pale pink those stronger tones of deep pink and crimson will produce their telling effect best by being introduced through the deep yellow and orange tones, as indicated at Sections 4, 5, 6, 7, 8, and 9. Any use of scarlet—if introduced at all—must be extremely restrained, as it is not a colour which harmonizes easily with others.

The planting will then be repeated in an inverse sequence, and the eye take pleasure in a repetition of paler colours which will lead directly through strong crimson and rich orange, and then through pink and flesh to creamy yellow, and again through the paler mauves to the stronger purples, before these merge again through mauve into greenish-grey and white as foils to the colour scheme at the farther (or eastern) end.

Height and Background

The heights of the plants, as will be seen by reference to the key, are, of course, arranged in harmony with the scheme; and

this should be borne in mind if it is preferred to substitute other subjects of similar colours in place of the types suggested. Large drifts of dwarf plants, as shown in the “edging” groups on plan, will be allowed to run up among the taller subjects, while these in their turn will break up the edging by being planted occasionally nearer to the front.

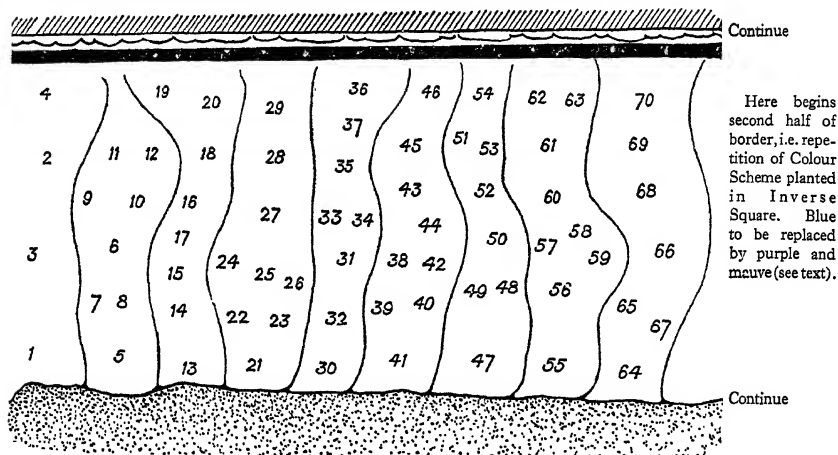
An important point in the general effect is that of surroundings and, more particularly, of the background, for which nothing can surpass an old wall. This will be made to support flowering climbers in colours to harmonize with the colour scheme. A good shrubbery may also form a suitable background, but if evergreens are used, only the best must be introduced, and the roots being hungry, care must be taken not to allow them to exhaust too greatly the soil in the neighbourhood of the flowers themselves.

The best method consists in making a narrow border against the wall, in which border the shrubs are planted, and then arranging for a very narrow walk between it and the main flower border. This walk, which can be simply made up with ballast, or even with ashes, will serve the gardener's purpose admirably, whether in giving attention to pruning and tying the climbers, or to tending the plants in the border itself. The walk will not be visible so soon as the plants have grown up.



Fig. 19.—Passion-flower

Here is an old wall, planted with Shrubs and Climbers in harmony with Colour Scheme



Edging of Turf over which the groups of plants in front line (Nos. 1 to 64) are seen to flow, as indicated by wavy line.

Colour Grouping. 1 to 4, Greys. 5 to 12, Whites. 13 to 20, Pale Yellow, 21 to 29, Blues. 30 to 37, Pale Pinks. 38 to 46, Deep Pinks. 47 to 54, Deep Yellow. 55 to 63, Orange. 64 to 70, Crimson.

Fig. 20.—Sketch Plan for planting Herbaceous Border. For names of plants and other particulars refer to key

KEY TO PLAN

No.	Plant.	Description.	Season.	Height.
<i>Greys.</i>				
1	Marguerite Carnation.	Foliage grey, flower white; annual.	July.	
2	Achillea, The Pearl.	Foliage grey, flower white; perennial.	August.	1½ ft.
3	Lavender.	Foliage; perennial.	August.	
4	Eryngium giganteum.	Foliage; perennial.	August.	8 ft.
<i>Whites.</i>				
5	Viola cornuta alba.	Perennial.	July.	6 in.
6	Phlox Berenice.	Perennial.	July.	2½ ft.
7	White ten-week Stock.	Annual.	July.	
8	Gladiolus Colvilli, The Bride.	Corm, re-plant yearly in April.	July.	1½ ft.
9	Japanese Anemone, Honorine Joubert.	Perennial.	September.	3 ft.
10	Michaelmas Daisy commutalis.	Perennial.	September.	3 ft.
11	Hyacinthus candicans.	Bulb.	August.	3 ft.
12	Sweet-pea, Nora Unwin.	Annual.	July.	5 ft.
<i>Pale Yellows.</i>				
13	Coreopsis tinctoria, Golden Ray.	Perennial.	July.	1½ ft.
14	Carnation "Daffodil".	Perennial.	July.	2 ft.
15	Antirrhinum, Yellow King.	Biennial.	August.	
16	Tree Lupin (yellow).	Perennial.	July.	3 ft.
17	Chrysanthemum, Carrie.	Perennial.	July.	4 ft.
18	Helianthus, Soleil d'Or.	Perennial.	September.	
19	Scabiosa Caucasica.	Perennial.	July.	
20	Cactus Dahlia, Caradoc.	Tuber.	August.	5 ft.

No.	Plant.	Description.	Season.	Height.
<i>Blues.</i>				
21	Blue Linum grandiflorum (followed by Lobelia, Cobalt Blue).		June.	6-12 in.
22	Salvia patens.	Protect in frost.	August.	2 ft.
23	Agathæa cœlestis.	Protect in winter.	July.	
24	Nigella, Miss Jekyll.	Annual (Love-in-a-Mist).	July.	2½ ft.
25	Veronica spicata.	Perennial.	August.	2½ ft.
26	Cornflower, Victoria Blue.	Annual.	July.	2 ft.
27	Anchusa, The Opal.	Pale blue	July.	
28	Delphinium, Cambridge Blue.		July.	2½ ft.
29	Delphinium grandiflorum.		July.	
<i>Pale Pinks.</i>				
30	Verbena, Miss Willmott.	Half-hardy.	July.	
31	Phlox, Thomas Moore.	Perennial.	July.	2 ft.
32	Carnation, Salmon Queen.		July.	
33	Gladiolus, Rosy Gem.	Corm, take up yearly.	August.	2 ft.
34	Lilium Speciosum roseum.		September.	3 ft.
35	Chrysanthemum, Cranford.	Treat as annual.	August.	
36	Hollyhock.	Double pink; biennial.	August.	
37	Sweet-pea, Countess Spencer.	Annual.	July.	5 ft.
<i>Deep Pinks.</i>				
38	Ivy-leaf Geranium, Souvenir de J. S. Turner.		July.	
39	Antirrhinum, Nelrose.		July.	2 ft.
40	Stock, Beauty of Nice.		July.	
41	Heuchera sanguinea.	Coral.	July.	
42	Larkspur, Lustrous.	Carmine.	August.	
43	Pentstemon, Spitzberg.		August.	3½ ft.
44	Lavatera splendens rosea.	Perennial Mallow.	July.	
45	Phlox Marin.			
46	Dahlia, Isadora Duncan.		August.	
<i>Deep Yellow.</i>				
47	French marigold.	Dwarf; striped.		
48	Montbretia californica.		August.	
49	Alstroemeria aurea.		August.	
50	Inula glandulosa.		August.	1½ ft.
51	Rudbeckia, Golden Glow.		September.	2 ft.
52	Chrysanthemum.	Treat as annual.	September.	
53	Kniphofia choloris.			4 ft.
54	Solidago Shortii.		July.	5 ft.
<i>Orange.</i>				
55	Nasturtium.	Terra-cotta; annual.	July.	
56	Calceolaria.	Brown.	July.	2 ft.
57	Nemesia.	Orange variety.		
58	French marigold.	Tall, orange.		
59	Gaillardia grandiflora.		August.	
60	Lilium Henryi.		September.	5 ft.
61	Helenium striatum.		September.	4 ft.
62	Dahlia.	Single Pink.	August.	5 ft.
63	Sweet-pea, Nora Unwin.	Annual.	July.	5 ft.
<i>Crimson.</i>				
64	Phlox drummondi, Crimson.	Annual.		
65	Begonia, Crimson.	Orange red.	August	
66	Antirrhinum, Crimson King.			
67	Clove carnation.	Perennial.	July.	
68	Monarda didyma.	Bergamot.	July.	
69	Chrysanthemum, Ethel Blake.	Treat as annual.		
70	Phlox, Etna.		September.	5 ft.

Second Half of Border

As suggested in the text, the farther, or eastern, end of the main flower border will be filled with purple flowers after repeating in other respects the colours at the opposite end. Working from front to back on the plan, therefore, the plants would include the following: *Campanula drabæfolia* and *Campanula pusilla* (4 in.); *Ageratum*, Little Gem (6 in.); *Artemisia stelleriana* and *Stachys lanata*, Lyme grass, and *Cineraria*



Fig. 21.—Perpetual Border Carnations

maritima, having grey or glaucous foliage, to support in broad drifts the taller subjects.

Then will come *Ageratum mexicanum* (2 ft.); *Geranium ibericum* and *Geranium dahuricum* (1½ ft.); and Early Michaelmas Daisies, such as *Aster acris*, *Aster Shortii*, and *Aster umbellatus*; *Campanula latifolia* and *Campanula longistyla* (2–2½ ft.);

Campanula persicifolia (1–3 ft.);

Campanula pyramidalis (3–5 ft.);

Echinops ritro (Globe Thistle) (3–5 ft.);

Clematis Jackmanni (grown on posts).

Background to Flower Border

The climbing plants and shrubs which will form the background of the border should include such beautiful specimens as the following, working from left to right behind the groups of plants in which the special colour of their flowers, &c., are seen to predominate:

Robinia (*pseudo-acacia*).

Laurestinus.

Nandina.

Abutilon vitifolium.

Loquat.

Bay (2 specimens alternately with Nandina).

Golden Privet.

Pomegranate (*Punica granatum*).

Siberian Crab (*Pyrus baccata*).

Fuchsia.

Winter Sweet (*Chimonanthus fragrans*).

Claret Vine.

Magnolia conspicua.

Choisya ternata.

Cistus cyprius.

Piptanthus nepalensis.

Carpenteria californica.

Abutilon vitifolium.

Loquat.

The All-Seasons Garden

Hitherto we have been dealing with proposals for a main flower border which should not be expected to give real æsthetic satisfaction for a period much exceeding six months in every year. Many enthusiastic gardeners, however, will certainly wish to count upon some pleasure from their gardens during nine or ten months, or even longer, and yet be unable to provide much beyond a single good mixed flower border to give it to them. The following lists and suggestions will be found helpful towards attaining this result.

Early Bulbous and Rhizomatous Subjects:

Christmas Rose (*Helleborus niger* and other varieties).

Winter Aconite, Snowdrops: The earliest winter bulbous plants.

Glory of the Snow (*Chionodoxa luciliæ*).

Crocuses: Need protection, by netting, from birds.

Early and late Narcissi, including all the daffodils of varying types.

Bluebells and Wild Hyacinths (*Scilla mutans* and *Scilla campanulata*).

Early and late Irises.

St. Bruno's Lily (*Anthericum*, white).

Tulips: Early and May-flowering.

Anemones and Ranunculi: These, like the Scillas, may be planted under flowering shrubs with good effect.

Herbaceous Plants:

Tree Pœonies and herbaceous Pœonies: Comtesse de Tuder (Salmon-pink), Baronne d'Alès (rose-coloured), are specially beautiful sorts.

Oriental Poppies: The white and pink shades harmonize with almost any colour.

Tree Lupins and herbaceous Lupins: All white, blue, and yellow shades; beautiful pink varieties also.

Leopard's Bane (*Senecio doronicum*): In flower from April onwards.

Corydalis ochroleuca, also *C. thalictrifolia*: Yellow bloom with fine foliage.

Eremurus: A tall plant of great beauty.

Funkia sieboldii: Has bluish leaves which harmonize well with foliage of Pœonies.

To combine with these, use early-flowering annuals in variety. These may be obtained by sowing in autumn.

Low-Growing Plants

Among low-growing plants the beautiful blue-lilac of *Phlox devaricata* should be largely in evidence, also *Arenaria montana*, tiarella, and the charming old-fashioned woodruff. The beauty of perennial candy-tuft can be relied on to fill even shady spaces with beauty; elsewhere purple aubretias, yellow alyssum, and the double arabis; while among pink and red flowers, London pride and *Heuchera sanguinea* are a never-failing source of pleasure early in the season.

From this period onwards the ordinary summer flowers will come into bloom, and a careful selection can be made from those suggested in the section devoted to the main flower border. The late-flowering subjects may include an ample allowance of hardy chrysanthemums, Michaelmas daisies, and the best old-fashioned dahlias.

Bulbs and Tubers

Snowdrops and crocuses are the earliest plants to flower out of doors, and from their season onward there may be a succession of bulbs in bloom in something like the following order: anemone, daffodil, hyacinth, jonquil, narcissus, scilla, tulip, pœony,

lily, gladiolus, iris, and tritoma. The dahlia is also a tuberous plant, but should be started in heat in spring and never be exposed to frost. The rest are hardy, and though all the better for being raised after flowering when the leaves have withered, they may be left where they grow, and thus treated will increase and form large masses of bloom. Bulbs, as a rule, prefer a light soil; heavy wet land is fatal to most. They should be planted between October and March, according to their season for flowering.

Pinks and Carnations

The carnation has been well termed the florist's pride, and the flower is so beautiful that everyone should grow a few plants at least. Layering is the usual method of propagation. In July and August a side-shoot is trimmed with a sharp knife and then cut half through. It is then pegged into soft sandy ground, where it soon roots, after which the layer can be separated from the stock. Carnations are divided into selfs,

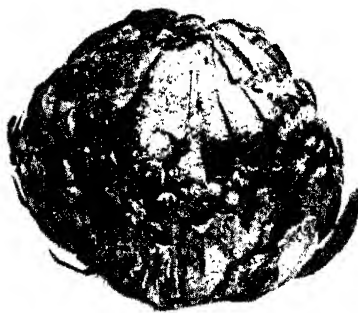


Fig. 22.—Bulb of *Lilium nepalense*

flakes, and bizarres. Selfs are, of course, of one colour. Flakes are striped with one colour, and bizarres are marked with several colours. Picotees differ in having laced flowers. What are called American carnations are certain free varieties that flower in winter and are easily managed. They are grown in pots out of doors all summer, and wintered in a cool airy house with a southern aspect.

PLANTING AND CARE OF GARDEN

Preparing the Soil

It must be borne in mind that a successful flower garden cannot be expected unless the ground has been carefully prepared. This should be done in autumn or early winter, unless for some particular reason it should be necessary to defer the work until the month of February. Much will depend upon both the soil and the situation. In principle, ground which is heavy requires to be thoroughly broken up and turned over some considerable time before Christmas. There are two reasons for this; one, that the soil may be thoroughly exposed to the frost and other influences of the weather; and the other, that it may not become caked and hardened by being trodden down after the winter rains, as will certainly be the case if digging be too long deferred.

There are other cases, however, in which spring digging is most necessary, and in which the serious work in this direction must be done at that time. In northerly districts, for instance, and in heavy soils, should an early winter overtake operations, it is undoubtedly true that, once the psychological moment has passed, it is best to wait even as late as March before touching the ground. Wind and sunshine will help the gardener in his work, and the month of April, if made the most of, will still afford the proper time for all planting—especially in Scotland and the north.

Improvement of Soil

The fact that an herbaceous border is intended as a permanent feature in the garden is sufficient to show that one of the first essentials lies in seeing that the ground should be of a suitable nature and suitably prepared. Almost any soil may be improved sufficiently if enough trouble is taken, while few, if any, soils will give successful results without attention.

Soil consists of an upper portion in which the roots of plants flourish, and a lower stratum known as the subsoil. It is neces-

sary, therefore, that the subsoil should be sufficiently broken up and that the upper soil should be enriched by good digging and the addition of manures. A clay subsoil is preferable, since it retains moisture during the trying days of summer. The surface soil, into which the roots will penetrate, must consist of at least 12 in.—and as much more as possible—of really good well-nourished garden mould. Loam, which is the gardener's ideal soil, should form the staple, and a certain quantity of the top spit of this "meadow land" should be incorporated with the soil already there. This will need to be further enriched with leaf-mould from a two-year-old supply.

How to Trench

Enough has been said to show that the ground should be trenched, or double-dug, and the method of doing the work must now be described. It should be mentioned that this thorough ground preparation is equally necessary for all cultivation of important crops, whether of vegetables or fruit or for permanent flower planting.

In trenching the ground, a space should first be marked out across the border between two lines. Have ready a wheel-barrow, and begin by digging out the soil to a depth of 18 in. or 2 ft., unless it be so extremely poor and shallow that it can only be removed to a spade's depth before the subsoil makes its appearance. All the soil removed should be placed in the barrow and be wheeled to the farther end of the ground where it is proposed to finish the work. Now proceed to thoroughly break up the subsoil, using a strong fork, or, if necessary, a pickaxe, for the purpose. Before starting the work, the entire stretch of ground should have been covered with heaps of stable or farm-yard manure in a properly decayed condition. This may either be thrown into the trenches as the work proceeds, or else be spread evenly over the ground so that it falls to the bottom when the next stage of the work is carried out.

Adding Fertilizers

The next stage consists in marking out a fresh trench, equal in width to the first empty trench which is now waiting to be made up afresh. On the further side of this second width of ground it will be convenient to place a scaffold board, and to chop down the soil while keeping one foot upon it, beginning with half the width nearest to the open trench, and then standing on the board to chop down the remaining half (nearest the digger).

When the entire width of soil has been thrown over in this way into the empty trench, it will be seen to be half filled, and the second spade's depth of the second trench will now have to be dug out and placed on the top of the first, bringing the whole up to its original level. First, however, a good fat layer of leaf-mould or rotted manure should be put in from a heap near by. While the digging out and making up is taking place, a good sprinkle of basic slag, if in winter, or superphosphate of lime or other fertilizer, if in spring, may be given, taking care that nothing touches the organic (stable or cow) manure itself.

One point is very important in digging out and piling up the soil, namely, that the soil dug out *first* should be placed towards the *front* of the trench it is desired to fill up. If this be not done, and the natural instinct be followed to throw the soil first to the back, it will be found impossible to build up a straight and solid edge to the broad trench or ditch dug out.

To Complete Trench Work

The second trench being now empty, proceed to throw down the soil from the third when it is marked out. The manure, as before, will fall naturally from the surface of the ground to the bottom of the trench. Dig out the third breadth of soil and pile it up on the second trench, taking care to build up the front first as before, and meantime incorporating the necessary manures, organic and artificial, as already described.

When each successive breadth of ground has been treated in this fashion, the soil

taken out from the first trench will be used to complete the last, and the whole will be left to sink and settle until planting time arrives. During the foregoing process any roots of shrubs, &c., should be sedulously removed and large stones be thrown to the bottom of the trenches to improve drainage.

Insect Pests in the Soil

Much difference of opinion exists as to the use of soil fumigants for the destruction of vermin in soils. Where new loam is introduced (and it has already been pointed out how important this medium is for planting) there will undoubtedly be danger of wireworms, click beetles, and other pests. Nothing perhaps is better than to sow the ground with gas lime, but it must be remembered that many weeks should elapse before such ground can safely be planted. The patent soil fumigants which are placed upon the market are recommended to those who wish for an easy method of applying carbolic to their soils for the purpose indicated. It is hardly necessary to point out the benefit of winter digging in order to expose many ground pests to almost certain death by frost.

Preparation for Planting

It may be said in a general way that spring planting is more profitable for the majority of plants than autumn planting, unless the latter can be done at an early date while the ground is still warm. Planting in cold wet soils is very likely to result in death to such delicate plants as pale blue delphiniums, or to rock plants used as edgings, which require a warm light medium in which to establish themselves happily. This, therefore, points to the fact that they should be put in in the spring, when they will escape the trying conditions of winter until a summer has passed, during which season they will have had time to establish themselves in the ground.

In preparing the soil for herbaceous plants, an effort will naturally be made to arrange pockets of gravelly or sandy soil for those which require particularly good drainage, as well as to make provision for what are technically known as "gross feeders".

Many new plants will probably be planted, but many may consist of divisions from stock already in the garden. In dividing old plants, one must be guided by the variety, and judge whether the plant should merely be pulled apart or chopped through the centre with a strong knife or a spade or fork. The hard centres of chrysanthemums and of Michaelmas daisies must be simply thrown away, and the finer fibrous growths will then be planted in groups, leaving ample distance for spreading out. A knowledge of how to plant at the right distances can only be gained by experience, since different plants grow and spread so very differently. Before such experience is gained, it may sometimes be found necessary to remove overgrowths during the middle of the season, or, on the other hand, to fill up gaps by sowing or planting out some quick-growing annual or half-hardy subject which harmonizes with the scheme. The utility of the greenhouse in this connection is obvious.

Planting Hints

The following are a few points in regard to good planting:

1. Do not allow the roots of any plants to be cramped or crowded, but make a hole amply deep and wide enough for each subject planted.
2. Do not bury the centres, or allow them to be choked with soil, or the shoots will not survive a cold wet winter.
3. Do not be afraid to use a trowel for working in the soil, even around large subjects, and to help further by spreading with the fingers the delicate root fibres rather than bundling them into the space available, as is so often done.
4. If obliged to plant in sultry weather, let the holes made be filled with water before placing the roots in position. This method, which is used too little where flowers are concerned, will often help plants which have arrived from a distance to become established happily, as well as those which resent disturbance. The planter keeps a water-can by her side, and fills each hole as it is made, thus allowing the roots a cool and moist condition in which to begin to settle.

5. It may sometimes be found good to sprinkle the clippings from the lawn around and between plants on the herbaceous border, especially where fresh subjects have been planted out and require protection from extreme heat.

When once spring weather marks the end of dangerous frosts, any protection in the shape of straw or bracken, &c., which it has been found necessary to lay over delicate plants, may be removed, and the ground should then be forked over. A dressing of some general fertilizer or of superphosphate of lime is an advantage at this time; it should be spread on the ground at the rate of half a pound to the square yard, and just pricked in lightly.

General Care of Herbaceous Borders

As the season advances, there will be plenty of routine work on the flower border. The use of the Dutch hoe or garden fork should be assiduous, especially during dry spells. Without aeration no plant can flourish, and judicious hoeing accomplishes this, as well as setting free the moisture from beneath the hard-baked crust, and generally promoting a cool and beneficial condition of surface mulch. Before watering, or when rain seems likely, the hoe or fork should always be applied, and it will, of course, fulfil the function of eradicating weeds at the same time, these growing apace as summer draws on.

Training and Staking

Constant efforts will be needed to keep the flower border neat and trim, especially the staking of plants as these grow taller, and also the removing of dead leaves and cutting down plants when they "go over". Staking requires especially skilful management, the object being in every case to secure proper support while effectually hiding the stake; when a single stake only is necessary, this is usually placed towards the back of the plant. The raffia is secured first to the stake and then drawn round the stems, leaving them loose enough to look natural. One thick strand of bast may often be split into several strands, thus necessi-

tating one piece only being used for each stake. Large clumps of plants should be treated with a triangle of bamboos, and annuals can be skilfully supported with small twigs of brushwood.

One of the greatest authorities on the flower garden has given the suggestion—which she herself has carried out with great success—of covering the deficiencies caused through early plants “going over”, by means of pulling down and training over them some annual or other plant of loose habit—as, for instance, clematis Montana, tall nasturtiums, or the chalk plant (*Gypsophila paniculata*).

General Care

At or before midsummer, according to the climate or season, the herbaceous border should receive a dressing of old manure, both for coolness' sake and to supply extra nourishment for the increase of growth.

Pansies, violas, and other plants which have a tendency to become straggly, will take a new lease of life if cut back at this period and allowed to break out afresh. As the year declines, all withered foliage must, by degrees, be removed until the attacks of the frost demolish the latest blossoms. Dahlias and other half-tender subjects must then be lifted, cleaned, and stored, and the remaining plants attended to, as dividing may be necessary before forking over the border in preparation for the winter season.

Seed-Harvesting

The seeds of flowers, as well as of vege-

tables, may be saved and selected. But, although there are some exceptions, the practice is not greatly to be recommended to amateur gardeners owing to practical difficulties, e.g. those of cross-pollination on the one hand, and the proper conditions for ripening, drying, &c., on the other. Still no one can deny the attractions of seed saving or the fascinating possibilities of hybridizing on one's own account.

When a good type is desired to be perpetuated, the flower head should be carefully surrounded with muslin from the time the flowers start to open, in the hope of keeping the plant true to type after pollination has taken place. The same rule will naturally be followed in cases where the grower has transferred pollen from another plant. It is often good policy to remove some of the weaker capsules from plants which are being saved for seed. When the seed has become plump, those heads which are being saved may be removed with a part of their stems, or the whole plant may be pulled up by the roots and hung from the roof of a cool dry shed or storeroom in a paper bag ventilated at one end so as to prevent the seeds moulding.

The seeds of podded plants may be removed in a green state when properly developed, and after spreading on shelves, the seeds may be removed at leisure during winter, but an over-warm or over-moist atmosphere must be carefully avoided if the seed is to germinate properly when sown the following year.

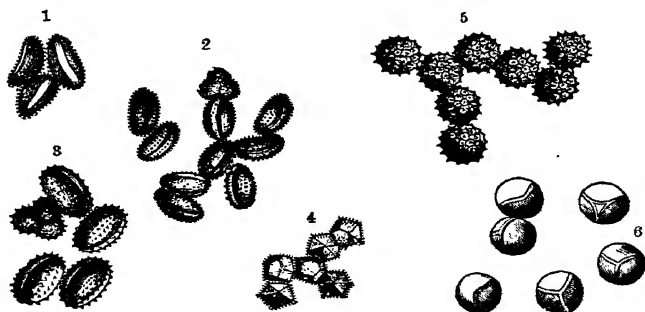


Fig. 23.—Pollen Grains, as seen under the microscope

1, Water-lily 2, Mistletoe Plants. 3, Carline-thistle. 4, Dandelion. 5, Horse-thistle. 6, Hemp

ROSE CULTURE

Best Position

It is the ambition of every amateur gardener to grow roses. Fortunately these beautiful flowers can be cultivated successfully in almost any garden and in any soil—if well worked and liberally fertilized—except a very light sandy soil, or positive chalk, in which they will not grow. When choosing a position for rose beds, it is advisable to secure an open situation sheltered from strong winds, but where air and sunshine abound. Climbing roses may be grown on walls and fences having a south or westerly aspect, or trained over pergolas or stout larch posts. Iron arches or posts connected by iron chains should be avoided.

Roses may be divided, according to their habits of growth, into standards, bushes, and climbers. Bush roses are preferable to standards for many reasons. They should be planted at a distance of from 18 in. to 2 ft. from each other, and far more effective beds result when roses of the same variety are massed in a bed than when a variety of kinds are all planted together. In a series of four or five beds cut in a lawn two varieties are effective, and the beds might contain alternatively dark-red "Richmond" and silvery-pink China roses (the common pink monthly), the ground being carpeted with a pale-mauve viola, or the rich deep-yellow of "Lady Hillingdon" might contrast with the flame and gold of "Queen Alexandra", London pride spreading a carpet beneath them.

Some Favourite Varieties

The following is a selection of good roses, all fragrant and all strong growers, classified by colour.

White.—Frau Karl Druschki, Mrs. David McKee, Viscountess Folkestone.

Red.—Richmond, General MacArthur, Hugh Dickson, Hadley, Mme Edouard Herriot (orange).

Pink.—Los Angelos, Mrs. John Laing, Ophelia, Caroline, Lady Pirrie, Dorothy Page Roberts, Mme Abel Chatenay, La France.

Yellow.—Christine, Mrs. Aaron Ward, Lady Hillingdon, Henrietta, Mme Mélanie Soupert, Rayon d'Or.

Climbers.—Gloire de Dijon (buff), Mme Alfred Carrière (white), William Allen Richardson (tea rose), Hiawatha (pink rambler), Dorothy Perkins (crimson rambler), Carmine Pillar (red), Irish Elegance and Isobel (pink). Several of those listed above are good climbing roses.

Rose Hedges

A charming division between different parts of the garden is formed by rose hedges; sweet-briar also is most fragrant after a shower, while a fence covered with varieties of Penzance briars or the bright yellow of the Austrian briar are always delightful. Another excellent way to grow vigorous roses is to peg down the long shoots which will bear flowers all along the shoot. Frau Karl Druschki (white) or J. B. Clark (red) are good roses for this treatment.

Making a Rose Bed

In rose culture, as in many other things, much depends on making a good start. To prepare a rose bed which will not need disturbing for years, remove the top soil to a depth of 18 in., for replacement when the lower spit has been well broken up with a fork to about 1½ ft., and some well-decayed stable manure well incorporated with it. The roots of the newly planted roses must not come in direct contact with the manure. After the top spit has been replaced a dressing of chalk may be given.

To Plant Roses

From mid-October until the end of November is the best time for planting, but it may be done at any time till the spring, as long as the ground is not too wet and the weather is open. In planting make your hole wide enough to thoroughly spread all the fibrous roots of the roses, having first removed all bruised or broken rootlets with a sharp knife. Cover the roots with dry, fine soil,

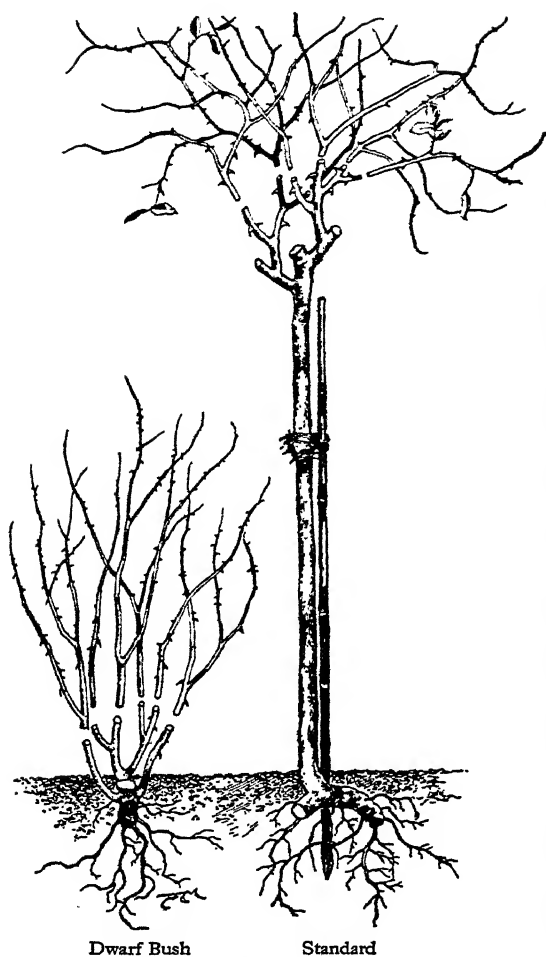


Fig. 24.—Correct Method of Pruning for Hybrid Perpetual Roses

tread firmly, and then fill in with the remaining soil. Roses should be very firmly planted. In November they may be earthed up like potatoes to protect them from frost.

Pruning

All varieties of roses except climbers and monthlies should be pruned well back in March or April. The object of pruning is to induce the rose to make new wood. An unpruned rose tree grows up and up, with less and less satisfactory blooms, and if not reinforced by shoots from the bottom

ultimately dies. Roses should be pruned to within 6 or 8 in. of the ground every spring, and standard roses pruned back also to dormant eyes. Rambler roses should not be pruned, but in autumn all the old and dead wood can be cut out.

Fertilizers

Roses in well-made beds require no manure till the spring, when they may be mulched with good stable manure. When the buds begin to form, bone meal or any good artificial manure may be used, at the rate of one or two teaspoonfuls to the bush, every four or five weeks while flowering. Dressings of soot will also help the blooms to be of good colour.

Budding Operations

A few brief directions as to the method of rose-budding are given here. Budding is usually performed in July, preferably in showery weather. It consists of taking a bud from a good tree and uniting it to a stock grown for the purpose (fig. 25). Select a bud on the year's shoot and cut it out with a small portion of bark. With the reverse end of the budding-knife, separate the bark from the wood, when the bud will be ready. Cut across the stock transversely and laterally, making a T-shaped cut. Raise the bark with the haft of the knife, slip the bud under the bark, and bind firmly with wool or raffia. The more quickly the operation is performed the more likely it is to succeed. So soon as the bud makes a shoot four inches long, cut back the original stock to the point at which it was budded.

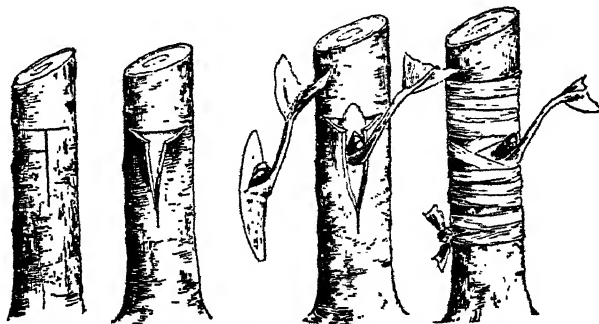


Fig. 25.—The Operations of Budding

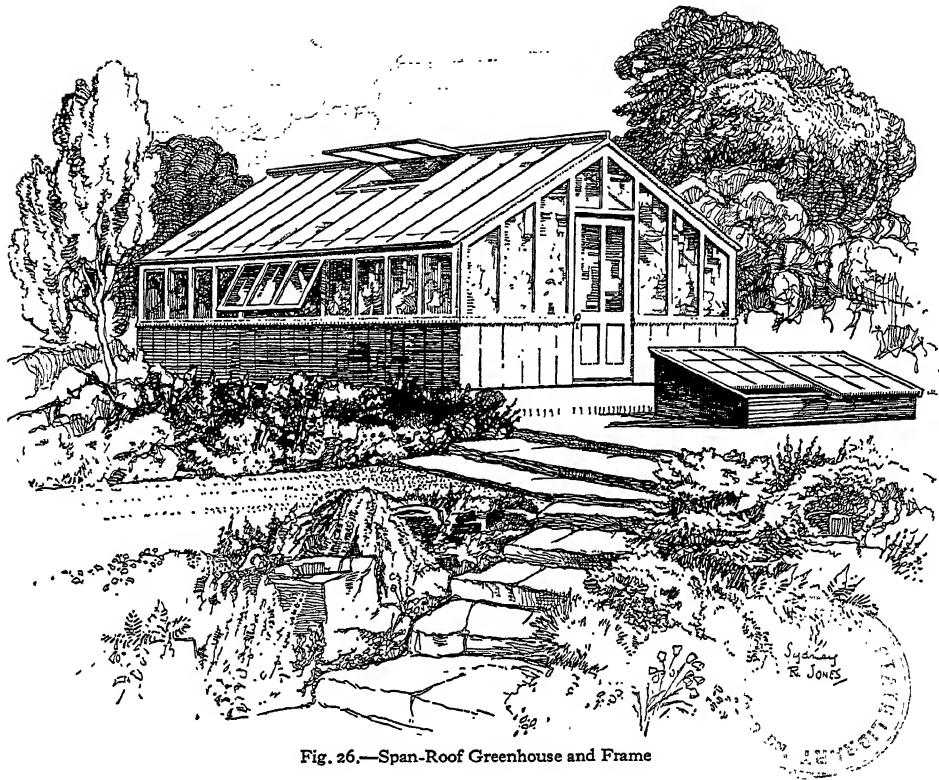


Fig. 26.—Span-Roof Greenhouse and Frame

GREENHOUSES AND FRAMES

A lean-to greenhouse is better than a span roof for keeping out the cold, but the span roof pattern undoubtedly affords more light and more room for plants. The walls of a glass-house—which, in the case of a lean-to, may be charmingly clothed with a climbing rose or other creepers such as lemon-scented verbena or heliotrope—are best formed of bricks with a ventilator here and there. The lights should be made of 21-oz. glass bedded in good putty. If possible, the greenhouse should have a southerly aspect, and the whole should be painted with two coats of white paint. A good-sized tank should be arranged to hold soft water outside the house, as this will be saved from the roof.

Heating the Greenhouse

The heating question will require careful consideration. It is probable that an upright

boiler will be found most convenient. The flues must be cleaned at least every fifteen days. Coke will be burnt in this type of boiler, but in the "saddle" form either coke, anthracite, or coal may be used.

If frames are placed against the house, one or more of these can be heated by connecting pipes from the greenhouse. The pipes in the greenhouse itself will generally be 4 in. wide, and should rest on bricks about every 8 ft. or so apart. One point is worth noting in fixing the hot-water pipes. Always see that these have an upward slope from the boiler, for the tendency of water, when heated, is to rise, and if the highest part of the pipes is close to the boiler the circulation is bound to be defective. There ought also to be an escape-pipe for the steam; without one, there is always the risk of an explosion. If a night temperature of

40° F. is maintained—which can be done in a little house at small cost—seeds can be raised, cuttings rooted, and ferns and flowers grown all the year round. It is even possible to grow grapes and force strawberries in such a house.

The Cycle of Work

The season of greenhouse work may be said to begin in February, but we are chiefly considering it here as a place for raising plants for the flower garden and for increasing stock. Where there is time to raise hardy annuals this should certainly be done in January or early February, so that the garden may be enriched with such subjects as balsams, schizanthus (Butterfly flower), salpiglossis, mignonette, asters, zinnia elegans, nemesia, and cinerarias. Phlox drummondii, browallia, and dwarf scabious are other uncommon flowers which can be grown from seed in the same way.

Many excellent biennials, or plants best treated as biennials, such as the antirrhinum and double stocks, may be raised in January for flowering the same year, while wall-flowers and many campanulas—also perennial plants in general—are best started in May or June. Fill some pots or boxes with well-sifted soil covered with silver sand, and then firm the surface with a board or a piece of wood cut to fit the size of the pot. Sow the seeds as thinly as possible and only scatter sufficient soil barely to cover them. Place the boxes upon the shelf of the greenhouse and syringe lightly, shading them until the young plants appear.

Pricking Off

When the young seedlings are fit to handle, fresh boxes or pots should be prepared, and the seedlings gently separated and pricked off into holes made sufficiently large with a pencil-like dibber. Great care must be taken at the early stages to ward off the attacks of damping-off disease (*Pythium de Barry-anum*).

Insect Pests

With regard to pests in general, any plants freshly brought into a greenhouse should be

looked over to see that they contain no mealy bug, which is apt to lurk in cracks, and is even sometimes found in pot soil itself. Any plants which have been attacked should be well sponged with soft soap and water mixed with paraffin, or with one of the compounds sold for the purpose. Plants in a state of rest may be repotted at the same time. A cure for red spider consists in keeping the house as moist as possible and syringing vigorously the plant attacked. Green-fly can be kept at bay by the use of insecticide applied with a soft brush or a very fine syringe.

Fumigation is, however, the most effectual remedy for insect pests, and the directions should be strictly followed which are invariably given when buying the compound used. Thrip can be discovered by the ravages of the pest on the under side of the leaves. Fumigate or spray the plants affected. Mildew, rust, and other fungoid diseases are best treated by dusting flowers of sulphur over the plants, but the state of the house as to airing and heating should be attended to first in all cases.

Cuttings

Cuttings of pelargoniums, &c., should be taken from the well-ripened new wood, just below a joint, in early autumn, or as early as possible in spring if from plants grown under glass. In the former case they must be inserted in boxes about 3 in. deep and 2½ ft. long, filled with a mixture of loam, sand, and either leaf-mould or well-decayed manure. The cuttings, when inserted in the soil, should be well watered and then placed in the open air for a time, but before the first frost they should be moved into the greenhouse. It is important to keep them only just moist, not sodden, and the leaves should not be wetted. Calceolarias are struck in the same way as geraniums, but not until September, and may be successfully rooted in a cold frame. Fuchsias, heliotropes, verbenas, and some others are generally struck in pots in spring. The cuttings should be put in in sandy soil, and placed on a shelf near the roof glass. Violas and pansies and also that useful

foliage plant *Veronica Andersoni variegata* will be planted in a cold frame or hand-light in autumn, and kept close till rooted.

Lobelias require a good soil and slight heat. Ageratum enjoys a very sandy soil, and should be placed in a frame and shaded from the sun. Resine and other foliage plants should be treated as prescribed for lobelia. Tuberous begonias should have their tubers started in March; the fibrous section may be treated as annuals.

Chrysanthemums

The amateur gardener has made the chrysanthemum his own, and certainly he

This is the time for disbudding, if show flowers are desired. Not more than one bud must be left on a branch, and not more than three or four, at the most, on one plant if the blooms are to come to perfection. At the beginning of October, or before the frost comes, the chrysanthemums should be taken into the house. They must not be crowded, and should be allowed plenty of air. They do not require more heat than is sufficient to keep the frost away. After flowering, the stems should be cut down, and the plants left to make their fresh growth under uncrowded conditions.

Chrysanthemums may also be grown out



Fig. 27.—Section of Forcing-tub with Manure

could have chosen no more suitable plant in which to specialize. It is very easy to obtain a stock of plants, for cuttings may be inserted from November till March; they are taken from the young shoots that spring up from the roots of the parent. If planted each in a small pot, and placed in a hand-light or cold frame half filled with light soil and covered with a piece of glass, they make roots rapidly. The young plants should be repotted in April into 4-in. pots. By the beginning of June they should be placed out of doors. They want a good deal of water, and the soil must never be allowed to become dry. Early in July they may be finally potted into large pots, and should be staked and firmly tied, and as soon as the buds are formed they may be liberally supplied with soot-water, cow-dung and water, or other stimulant.

The roots should be divided in the spring, and the stalks cut away after flowering. Grown in this manner the blooms are, of course, much smaller but more plentiful. Really good flowers may be grown on plants trained against a south wall. Chrysanthemums like a strong loamy soil, a compost of loam (2 parts) and leaf-mould (1 part), with the addition of sand, being excellent.

Pits and Hot-Beds

Cold pits and frames are sometimes more convenient when constructed with hinged lights, the necessity of pulling them off and on being thus avoided. A very effective cold pit may be cheaply constructed by making walls of turf some 18 in. high and 1 ft. thick, digging out the centre 6 in. deep, substituting cinders, and finally putting on an old light.

This rough-and-ready pit will serve to protect such plants as violets, hydrangeas, calceolarias, and pansies; indeed, if placed in a sheltered position and covered with sacks in frosty weather, it can be used for geraniums and fuchsias, while, with care, even pelargoniums can be kept in it. Such a pit is most useful in spring to harden off plants before setting them out.

Hot-Beds

For heating a pit or frame, fermenting material is generally used. Where stable manure is abundant, no gardener should be without a hot-bed. In a brick pit the manure is placed at the bottom, and, after the first fierce heat and fumes have passed, the material is covered with fibre or mould to a depth of 3 or 4 in. Such a pit serves admirably for raising young plants from seed, the pots being inserted in the mould.

Making up a hot-bed for a frame is rather different. Equal parts of manure and leaves should be obtained, and the manure thoroughly shaken out and mixed. If it is too

dry, add two or three pails of water per barrow-load. At the end of a week or ten days, turn over the heap again, and after another three days the bed may be made up. Build it firmly and squarely, trampling down the manure as tightly as possible, leaving a margin of 18 in. beyond the frame each way. Finally, place the frame on the bed, and when the thermometer shows that the heat is beginning to be steady, put on the soil. In this frame, if the bed be properly built, the heat will keep up for ten or twelve weeks, by which time the sun will have sufficient power to ripen the cucumbers or melons planted in it. The plants should be set in turfy loam in the centre of the bed, and as they take time to spread there is plenty of space for pots, or boxes, of seed. The cultural directions for cucumbers in frames are the same as for those in a house; but in the hot-bed the syringe may be used freely, and ventilation given during the day by slightly tilting the lights. If the bed is made in February and seeds are sown at once, cucumbers should be ready to cut by the end of April.

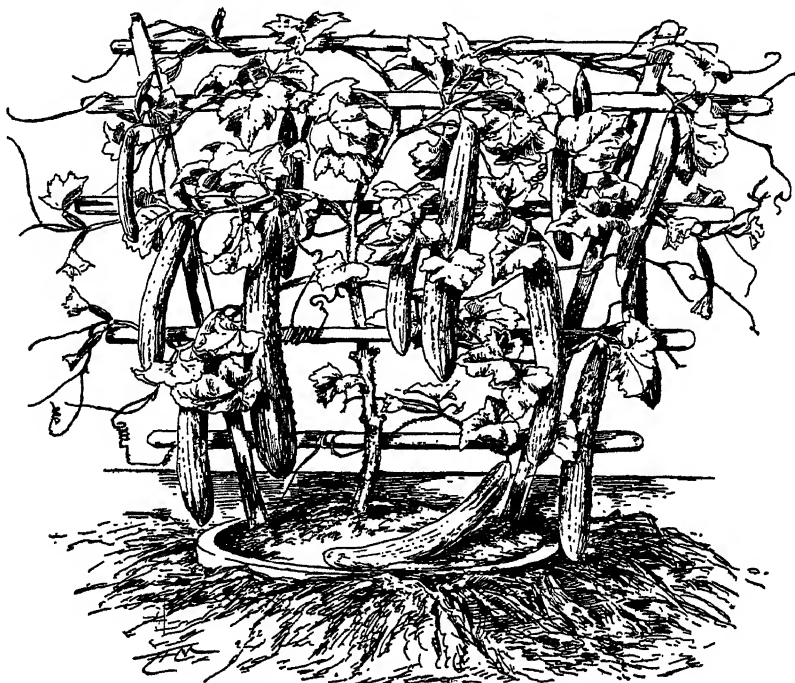


Fig. 28.—Framework for training Cucumbers

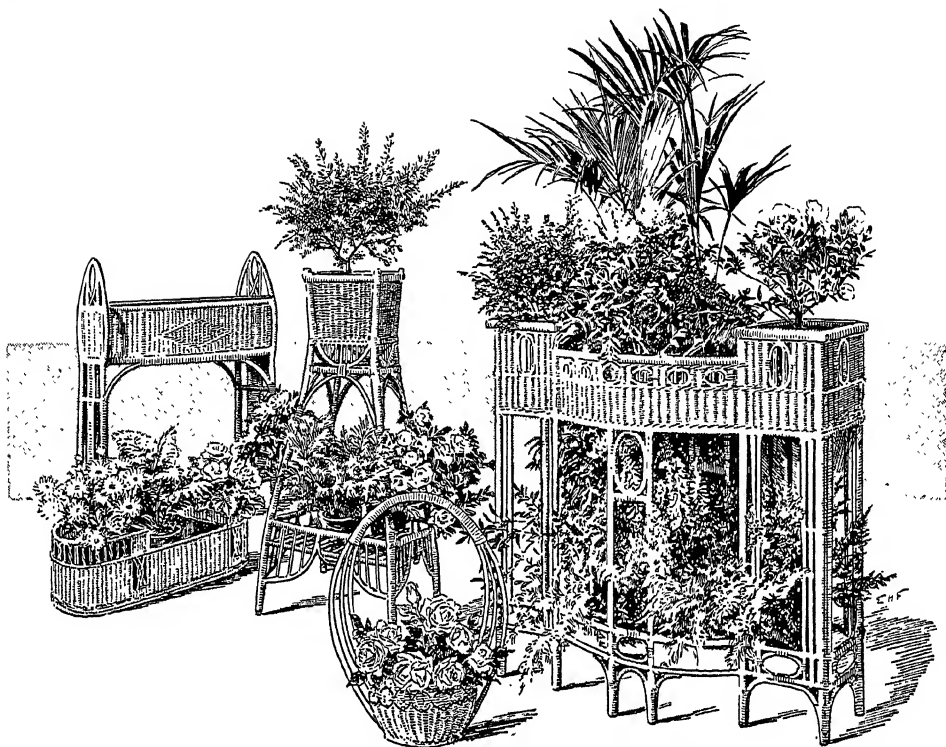


Fig. 29.—“Dryad” Cane-work Flower Baskets and Stands

PLANTS FOR INDOOR DECORATION

Amateurs who are not in possession of a greenhouse will need to give special attention to the kind of plants they cultivate in their dwelling-rooms. This is because they cannot remove a plant at will to be nursed up again in the genial atmosphere of the glass-house when once the deleterious effects of an over-dry atmosphere, draughts, and possibly gas fumes have become visible in their favourites.

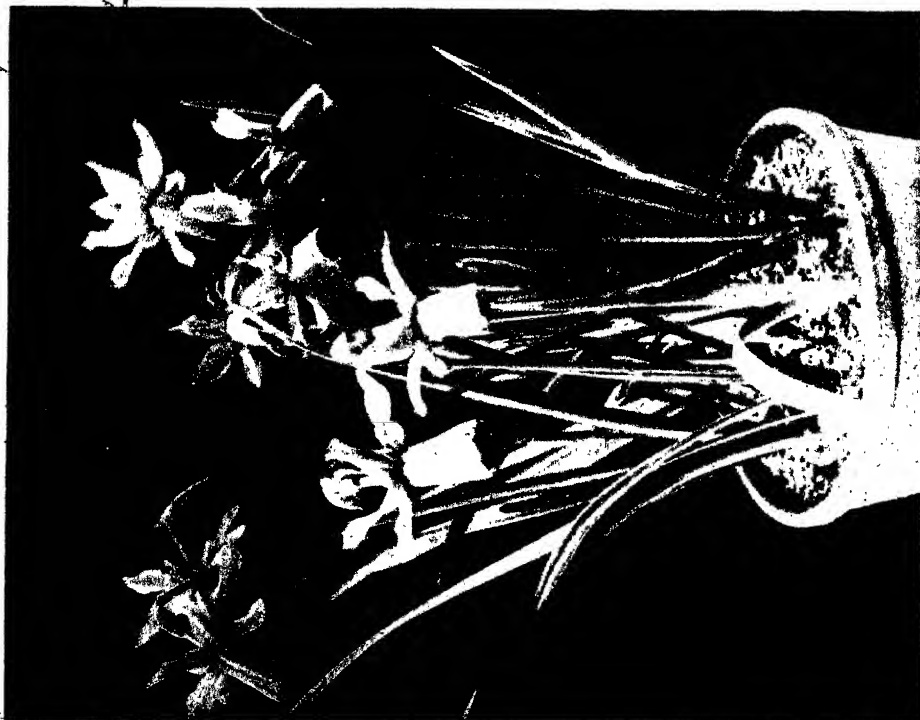
The homely aspidistra, known as the “parlour palm”, is probably the plant which best merits the description of being “hard to kill”. This plant and the *Pteris serrulata*, as representing common ferns, may here be taken as types for description of potting and general care.

Care of Plants

Cleanliness is a great point in the successful

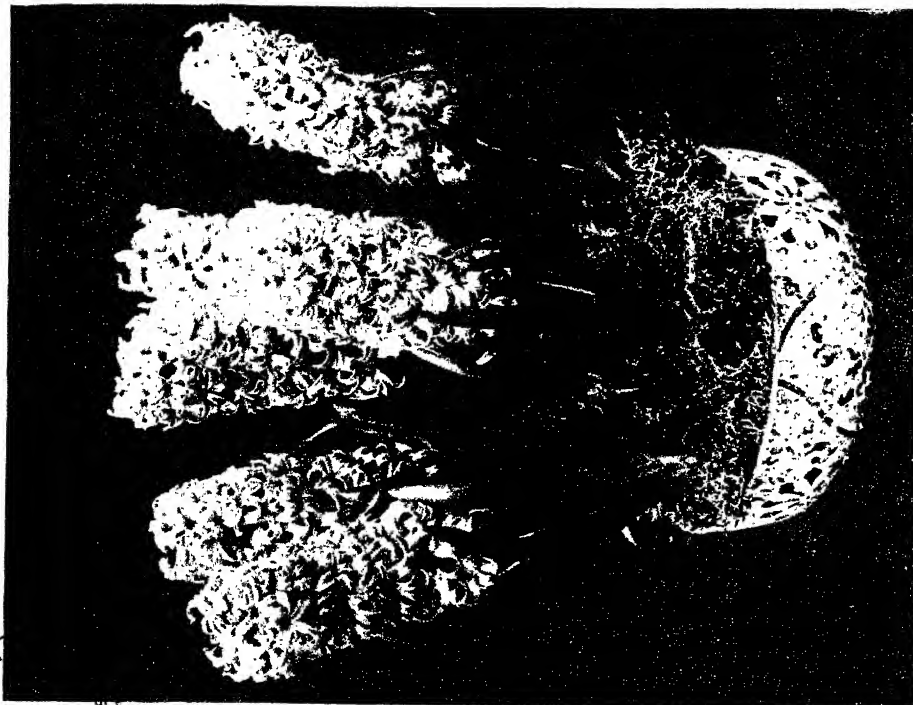
cultivation of plants in rooms, but there are different ways of securing it. The wrong way is to souse one's plants under an ice-cold tap of hard water. A help in the right direction lies in placing one's plants out of doors in genial weather, once a week or more, and letting them profit by a fall of steady gentle rain. Further than this it will be found necessary to clean the plants by spraying or spongeing gently, and for this purpose warm water and soap may be used, or one of the patent compounds which serve as an insecticide at the same time.

The broad strong leaves of an aspidistra, or of an india-rubber plant (*Ficus elastica*), may be briskly sponged from the base outwards, beginning with the back of the leaf, so that the hands may not risk smearing their surface.



Photograph by C. Raffill

Daffodils grown in a pot



Photograph by R. Malby

A bowl of Hyacinths

INDOOR CULTIVATION OF BULBS

1. *Phragmites australis* (Cav.) Trin. ex Steud.

Suitable Indoor Plants

Appended is a list of foliage plants suitable for growing in dwelling-rooms, with brief notes on their characteristics and general culture.

Aspidistra lurida.—This is the "parlour palm" already referred to above. The green varieties are not interesting, but variegated leaves may be encouraged to grow by keeping in a light place and not repotting too frequently.

Cordylina (Dracena).—Same treatment as for palms (see below).

The "*Fig Leaf Palm*" (*Aralia Sieboldi*).—The glossy leaves are grateful for sponging in order that they may be seen at their best. Do not allow this plant to stand in a draught.

Grevillea robusta.—A fern-like plant with fine-cut foliage; this variety is very graceful for indoor decoration.

India-rubber Plant (Ficus elastica).—Is not as a rule difficult of cultivation, so long as it is not left in draughts. Its glossy drooping leaves should be sponged frequently. This plant may be increased by "ringing"—an interesting experiment for amateurs to make in the increase of their stock.

Umbrella Plant (Cyperus alternifolius).—Appreciates similar treatment to that of the *Aralia*.

Ferns for Indoor Cultivation

Ribbon Ferns (Pteris serrulata and others).—Small specimens of these make a pretty element of decoration if grown in green or white ornamental pots. Arranged in this way, with a covering of moss over the soil, they may occasionally take the place of flowers on the luncheon table.

Hart's Tongue Fern (Scolopendrium vulgare).—Very hardy out of doors, this fern needs keeping clean if in a room, and prefers not to be left near gas.

Shield Ferns (varieties of *Polystichum* or *Aspidium*) including the *Holly Fern (Aspidium lonchitis)*.—These are extremely decorative.

Maidenhair Ferns (Adiantum capillus-Veneris) and other "Spleenworts" can only be cultivated in the dwelling-house where

great care is given to their health and well-being. Other "Spleenworts", such as the *Maidenhair Spleenwort (Asplenium trichomanes)*, may be successfully grown in a "Wardian case", but the crested form of the *Black Maidenhair Spleenwort (A. Adiantum nigrum)* is considered difficult to grow. The *Sea Spleenwort (Asplenium marinum)* has also been successfully cultivated at times in an ordinary dwelling-room.

Carrot-Top Fern (Asplenium bulbiferum).—This is one of the prettiest ferns for indoor decoration. If wished, remove the tiny bulbils from the fronds, pot them, and bring on gradually to increase the stock.

Palms

This subject is a rather wide one, as there exist over a thousand kinds of palms, but comparatively few, of course, are known as common plants for the conservatory and house. A list is given of those which will endure the comparatively cool and dry temperature of the dwelling-house, although some might occasionally succumb to the effects of frost. The *Kentia Fosteriana* and *K. Belmoreana* are among the best palms for growing in rooms. The *Kentia* and *Phoenix* are good examples of the feather-leaved group. Dwarf *Phoenix* palms grow from 2 ft. upwards. *Cocos Weddelliana* requires rather more heat and moisture, also *C. Plumosa*. Both are somewhat tall and only suitable for hall decoration, the former, which is the shorter of the two, reaching 4 ft. in height.

Take care that palms when bought are likely to be such as have been taken from a cool greenhouse and have not been forced for the market. Otherwise they may soon take a chill in the dwelling-house. Palms dislike being frequently repotted, but may be top-dressed at will. Their leaves should be gently sponged with soapy water and syringed from time to time; or the palms may be placed out of doors in a summer rain.

Cacti

These popular plants are good for room cultivation, and their propagation is always interesting when it is a question of detaching

and replanting the baby cacti which appear upon the parent body. Some sorts of cacti (*Phyllocacti*) flower from time to time. Cacti are easily cultivated if kept free from dust; and great attention is needed, while keeping them clean, not to overwater the plants during the winter as they are practically dormant during these months. While growth is not proceeding, nothing is needed



Fig. 30.—Cacti (*Phyllocacti crenatus*)

but to see that they do not become absolutely dry. Some mortar may be mixed with the soil when repotting, and this work should be done during March and April. Make the soil moderately firm, and do not risk rotting off by giving too much water.

The small sorts of cactus, such as *Echinopsis* and *Mamillarias*, ought to have their pots three-parts filled with broken crocks because of the small amount of roots which are emitted. Rotting of the tissues is the one danger to be avoided by care in regard to giving water. If any part of the surface should seem to be rotting, cut it out fearlessly with a sharp knife and expose the plant to dry air afterwards. Cacti are, as a rule, free from pests; but if mealy bug is

seen to afflict the hairy or spiny sorts, these should be sprayed with soft soap and water to which a wineglassful of paraffin has been added. Two ounces of soft soap to a gallon of water is the right proportion. Syringe with clean water and repeat the operation after several days.

Secret of Success

The secret of success in the cultivation of room plants, of whatever kind, lies in studying their needs, and where the giving or withholding of water is concerned this need is pre-eminent. People often inquire thoughtlessly about some plant, "How often shall I water it?" forgetting that no cut-and-dried answer can possibly be given. The kind of plant, the conditions of its growth, effect of season and atmosphere, and many other things must be taken into account, and all but the first of these are constantly changing.

The "old hand" who, when asked how often a plant ought to be watered, replied laconically, "When it wants it", actually put the case in a nutshell, and gave valuable food for thought on the matter.

Judicious Watering

It is safe to say that more harm is often done by over-watering pot plants than by under-watering; but in the case of room plants, a good soaking when needed should be given with a can. The practice of standing plants in a bath of water for several hours, rather than of ordinary top watering, should only be resorted to occasionally. It is, of course, necessary to do this if by accident a plant has become very dry. During the season of active growth, soot water may be given, or a very weak application of some reliable artificial manure. The proportions indicated by directions sold with plant foods should never be exceeded. Soot water is best given as a stimulant once a week or so, and it should be diluted to a pale grey before use.

If leaves have become brown at the tips, this may have been caused by too little water having been given, which robs the cells of moisture and causes shrivelling of tissues. A peculiar disease—known as the

shot-hole fungus—causes the brown spots sometimes seen on leaves. Healthy growth and good nourishment will be the best guard against such dangers as this. Should leaves be seen to turn yellow or fall, the roots and the soil must be examined, first, of course, removing the plant from its pot. To do this, cover the surface with the fingers and turn the pot carefully over, then tap the rim upon a ledge or table, when the entire “ball” of soil and roots should come out

already soiled by use, let them be washed and dried, or at least rubbed over vigorously, inside and out. A dirty pot will cause serious breaking of roots when next repotting takes place. Now cover the hole with a clean broken potsherd, hollow side upwards, and lay smaller pieces on the top of this, finishing off with finer fragments. This will prevent the soil washing down and choking the drainage. A wad of fibrous soil or some half decayed leaves placed

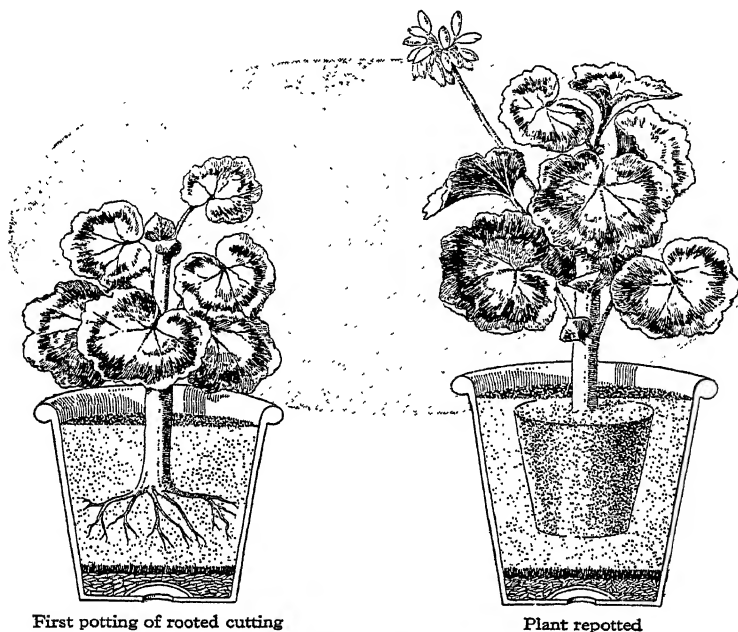


Fig. 31.—Repotting

intact. Shake away as much of the soil as will come easily, using a piece of stick if required to “clean” the ball more effectively, but in a gentle fashion.

If there is a firm ball of soil, it is usually best not to disturb it, but, in this case, it becomes of special importance to place the whole in a very much larger pot of fresh soil, enabling it by degrees to develop fresh roots and absorb nourishment.

How to Repot

Should the flower-pots be new, they should be soaked in water before using; if

on the top of the drainage will further keep the soil from being disturbed.

Unless reliance can be placed upon the source of florists’ so-called “potting soil”, it is usually better—and certainly cheaper—to make one’s own, using as the main ingredients two parts of meadow “loam” (see *Flower Garden* section for this), and one part of well decayed leaf-mould. Mix with these ingredients about a twentieth part of silver sand, and let the whole be in a warm and fairly moist (but not a wet) condition before using. Put some of the compost into the pot, and then place the

plant upright inside, spreading the roots if possible, and filling up all round with new soil, making this fairly firm with a wooden potting stick, which may be made from the handle of a broom, bluntly shaped at one end so as to be convenient for working the soil round. Hold the plant firmly with the left hand while potting, and be sure that the plant is kept upright and is exactly in the middle.

The soil in any of the smaller-sized pots—i.e. those under 5 in.—will need to be firmed with the fingers only. When filling up the soil, leave a good clear rim at the top for watering. One of the most frequent faults in amateur potting lies in stuffing the pot with soil right up to its edge. Some inexperienced hands, on the contrary, will leave an enormous space unfilled. The happy mean may be easily reached by a little observation and practice in the art (see fig. 31).

Top-Dressing and Increasing

Repotting is usually best done in spring, when plants are starting into growth. If a plant appears out of health, repot at other times, except, of course, in the winter. There are not a few plants, such as palms and others, which dislike repotting, and these must be top-dressed whenever they seem likely to need additional nourishment. The top-dressing of room-plants should be done by first scraping away the top soil, and then replacing it with a nice compost consisting of fine light soil mixed with a little sand and a small quantity of some one of the fertilizers sold for the purpose.

When repotting ferns and plants in spring will be the right moment to increase a number of these by division. This may be accomplished either by cutting the roots through with a sharp knife, or by merely pulling them apart and discarding any worn-out growths before repotting. Occa-

sionally it may happen that a worm enters a pot and disturbs the roots of its occupant. If the worm cannot be seen by turning the plant out and gently prodding the "ball", a teaspoonful of carbonate of ammonia may be mixed with tepid water and the plant be watered with it. This should bring the worm to the surface, when it can be removed.

Care of Cut Flowers

The care of cut flowers, indoors, is worthy of more attention than it usually receives. There ought, as a rule, to be no difficulty in removing the flowers of ordinary green-stemmed plants from their vases every second or third day in order to cut off the tips of their stems and to expose a fresh surface to the water, which should be changed at the same time. A tiny knob of charcoal placed in the water not only acts as a sweetener, but provides plant-food. Sugar, at the rate of 20 per cent proportion to the water, has been recommended for its food value, especially for flowers picked when in the bud, as, for instance, pæonies. Some little time ago, a special preparation in tabloid form was put on the market for the purpose of prolonging the life of cut flowers in water, and such preparations may with advantage be tried.

Hard-wooded stems should be treated by gently peeling the bark a few inches up the branch in order that the soft tissue may come directly in contact with the water. All stems should be stripped of their leaves up to water level, as water-sodden leaves soon rot.

When flowers are received by post, they should be unpacked and placed first of all in a bowl of very warm water, leaving them a little time to revive before being arranged. In packing flowers to travel by post, the great point, of course, lies in packing them so tightly that they cannot be jostled about.

THE VEGETABLE AND HERB GARDENS

A Continuous Supply

The supply of good fresh vegetables is so important to the health of a household that the country kitchen garden must needs hold an important place in the average householder's mind. Undoubtedly the secret of success lies in forethought as well as in careful cultivation. It is of no use to leave the vegetable garden to the last minute, and then rush in a large number of crops. The result would deserve to be unsatisfactory; many vegetables of one kind would come to maturity at the same time, go off together, and leave the kitchen unsupplied until a second crop could mature. What should rather be aimed at, however small the available space, is to procure a regular succession all the year round, and the table on the next page shows how this may be done.

Cropping

Two, three, or more crops may be grown on the same plot in the year, sometimes two concurrently, or even more (on the French system). For instance, when the earliest potatoes, planted in February, are lifted in June, the lettuces sown in the seed bed in April or May will be ready for transplanting to the cleared ground, and when they are cut in August, savoys can be planted in their stead. Again, the main crop of potatoes is lifted in September, but there is, as a rule, no reason why young kale, Brussels sprouts, and broccoli should not be dibbled between the rows in July and August. The potato haulms will shade the young plants from the fierce sun, and if the work be carefully performed, the removal of the tubers will not injure them.

Cultivation of the Soil

The great thing is to keep the soil always clean and in good heart, i.e. wholesome and well nourished. Weeds take as much from the ground as a crop, and must be kept down; but even if the hoeing be well done, it is only

natural that constant and heavy cropping must exhaust the fertility of the land, so that it is of the utmost importance to pay attention to cultural operations and manuring. By cultural operations are meant the thorough and deep digging of the soil, with subsequent cultivation between the crops. The spade or fork must go down at least 1 ft. below the top soil and break it up. Trenching and rough digging *in the autumn* are of the greatest value, more particularly because of the action of frost in breaking up and sweetening the soil, thorough pulverization being as valuable as a coat of manure.

Nothing can be grown properly in clods; the fine roots have no chance in such a medium. Air is, in a real sense, the basic condition of soil fertility, since, as we know, the free oxygen from air is one of the raw materials required for the production of nitrate from ammonia. It is evident that without deep digging and subsequent forking and hoeing the proper aeration of soils cannot take place. Consequently, therefore, the need for cultivation must be obvious if our plants are to be well nourished and in a healthy state.

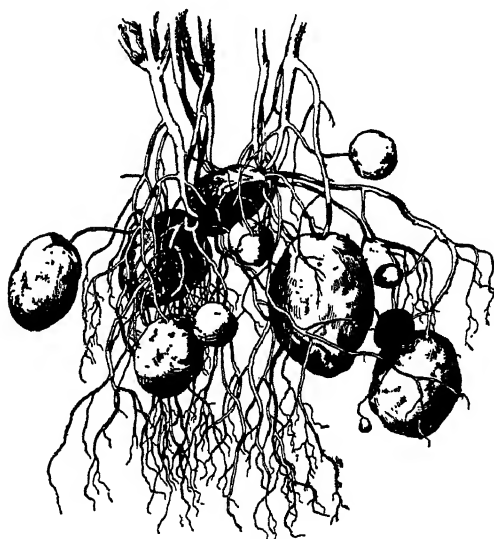


Fig. 32.—The Potato

KITCHEN GARDEN CALENDAR

A GUIDE FOR OUT-DOOR VEGETABLE CULTURE

Month.	To Sow.	To Plant Out.	Vegetables Ready for Table.
JANUARY.	Beans (in frames), cress (in frames), mustard (in frames).	Early cabbage, underground onions (i.e. "potato onions").	Cabbage, celery, endive, savoy, sprouts, parsnips.
FEBRUARY.	<i>Leeks</i> , broad beans, cabbage, <i>celery</i> , lettuce, <i>peas</i> , <i>tomatoes</i> , corn salad.	Potato onions, onions, shallots, chives, Jerusalem artichokes.	Cabbage, cauliflower, endive, savoy, turnips.
MARCH.	Broad beans, <i>Brussels sprouts</i> , <i>broccoli</i> , kohlrabi, cabbage, <i>celery</i> , <i>cauliflower</i> , lettuce, <i>marrow</i> , onions, parsnip, peas, radishes, spinach, sprouts, parsley, <i>seakale</i> , salsify.	Lettuce, radish, potatoes (sprouted), Jerusalem artichokes, rhubarb, onions, horseradish, mint.	Cabbage, broccoli, endive, lettuce, savoy, turnips.
APRIL.	Asparagus, beans (French), scarlet runners, broccoli, <i>savoy</i> , <i>cabbage</i> (borecole), carrots, <i>cauliflower</i> , kale, lettuce, <i>marrow</i> , onions, peas, potatoes, radishes, spinach, <i>seakale</i> , sprouts, turnips, parsley, herbs, small salads.	Cabbage, lettuce, sprouts, rhubarb, asparagus, <i>seakale</i> (plants), herbs (by slips).	Cabbage, broccoli, lettuce, rhubarb (early).
MAY.	Beans (French), scarlet runners, beet, peas, broccoli, <i>cauliflower</i> , <i>cucumber</i> , chicory, capsicum, lettuce, peas, potatoes, radishes, turnips, marjoram.	Cabbage, celery, lettuce, marrow, sprouts, leeks, maize (Indian corn).	Cabbage, lettuce, radishes, rhubarb, potatoes (earliest).
JUNE.	Beans (French), cabbage, endive, lettuce, radishes, <i>savoy</i> , turnips.	Celery, cabbage, cauliflower, cucumber, lettuce, marrow, sprouts, tomatoes, capsicum.	Broad beans, lettuce, peas, potatoes (early), radishes, rhubarb.
JULY.	Early cabbage, endive, lettuce, radishes, <i>savoy</i> , prickly-seeded, spinach, turnips, parsley.	Cauliflower, lettuce, marrow, sprouts.	Beans (all sorts), broccoli, lettuce, marrow, peas, potatoes (come in and continue), radishes.
AUGUST.	Cabbage, cauliflower, endive, corn salad, onions (winter varieties).	Cabbage (i.e. celerworts), winter kale, lettuce.	Beans (all sorts), cauliflower, carrots, cucumber, lettuce, marrow, onions, peas, radishes, spinach, tomatoes, turnips, artichokes (globe).

Month.	To Sow.	To Plant Out.	Vegetables Ready for Table.
SEPTEMBER.	Cabbage, onions, winter spinach.	Cabbage, lettuce, savoy.	Beans (French), beet, cauliflower, cabbage, carrots, celery, cucumber, lettuce, marrow, peas, radishes, spinach, tomatoes, turnips.
OCTOBER.	Broad beans (if suitable).	Cabbage, broccoli, savoy.	Beans (French), beet, broccoli, cabbage, carrots, celery, cucumber, lettuce, marrow, spinach, tomatoes, turnips.
NOVEMBER.	Broad beans (if suitable).		Beet, cabbage, celery, endive, sprouts, spinach, turnips, Jerusalem artichokes.
DECEMBER.			Broccoli, cabbage, borecole (winter kale synonymous), celery, endive, sprouts, turnips.

NOTE.—(a) When the name is printed in *italics*, the seeds should at that period be sown in heat.

(b) In Scotland and northerly districts sow two or three weeks later.

Hints on Vegetable Culture

Naturally, different kinds of vegetables require different treatment. For the benefit of the amateur gardener a few hints are given on the special culture of the commoner sorts.

Asparagus.—This plant will grow in any well-cultivated soil, but it loves sand and salt. Choose, therefore, the sandiest ground available in the kitchen garden, in a nice open situation. Deep digging in winter is desirable, with an average dressing—say 6 in.—of half-rotten stable manure added at the same time. The surface may be levelled down in spring, and a little extremely well decayed manure added to prepare the seed-bed. If clay or other damp soil has to be dealt with, as much lime-rubbish and other lightening material as possible should be dug in, and the beds must, in this case, be well-raised above the surrounding level, to ensure warmth and good drainage for the crop.

A bed 3 ft. wide may be planted with two rows of plants, each row being set 1 ft. from the margin of the bed. Each plant should be set 12 to 18 in. from its neighbour, according to strength of plants and soil. The crowns should be buried 3 in. deep. If seeds are sown, this should be done in single pots—or in the open in March—about

9 to 12 in. apart, transplanting to the beds in the following year. Do not cut for the first year, even from one or two year old crowns, and not much the second. Give plenty of water and keep the crop free from weeds.

Liquid manure may be alternated with clear water after the first year from May to August. Three inches to the square yard of common salt or nitrate of soda should be given in March, and when the cutting ceases in June, the bed should be well manured with liquid fertilizer. All foliage should be cut away early in November and the beds dressed with stable manure or seaweed if the latter can be had. Good varieties of asparagus are Sutton's Giant French, Connover's Colossal, Purple Argenteuil.

Beans, Broad.—Beans do well on most soils. Sow in rows 4 in. between the plants and 1 ft. between rows. Nip off the tops when well developed, to strengthen the plant and check black aphid.

Beans, French.—Sow French beans in rows 2 ft. apart and 3 in. between the seeds. Thin if necessary.

Beans, Runner.—For runner beans sticks or trellis-work are required. They form an excellent blind to cover unsightly spots. The rows should be 3 ft. apart at least, more if possible.

Beet.—Sow in drills $1\frac{1}{2}$ ft. apart. Thin the young plants out to not less than 9 in. apart. Take up in November and put in frost-proof quarters in or out of doors. Parsnip culture resembles that of beet.

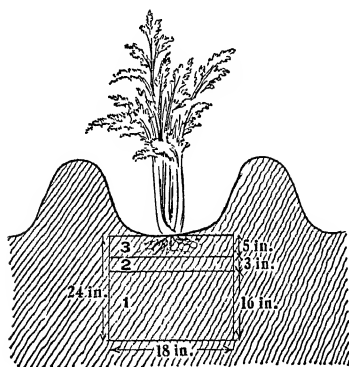


Fig. 33.—Celery Trench

1, Manure; 2, Leaf mould; 3, Ordinary soil

Broccoli, Cabbage, Kales, &c.—Sow in boxes or on seed bed. Thin the young plants early and transplant when ready for their final move. Plant out from 1 to 2 ft. apart, or farther for the largest kinds.

Carrots.—Thin early and pay special attention to weeding. The finest carrots are grown where the most attention has been paid to getting the soil fine. The drills should be about 18 in. apart, and the seed should be only just covered (fig. 34).

Cauliflowers.—Raise in gentle heat. The late sowing in August is only recommended to those who can protect in winter.

Celery.—Raise in February in gentle heat. Prick out in rich soil in boxes, and finally transplant to well-manured trenches. Give plenty of water, and earth up to blanch the stems.

Cucumber.—Raise in heat. Plant in warm bed of manure covered with soil. Give plenty of water.

Endive.—Thin out when grown to 1 ft. apart; tie the plants in; otherwise cover with inverted pots to blanch, or with pieces of slate.

Lettuces.—Transplant from the seed bed to 8 or 9 in. apart each way. Quick growth is essential; therefore they should have rich

soil, plenty of water, and a sunny situation. After May the seeds should be sown as recommended for carrots, and the plants thinned.

Marrows.—An old manure heap or rubbish corner in the sun, where there is plenty of rich decayed vegetation, suits this plant. Give plenty of water in hot weather.

Onions.—A good seed bed, very finely raked, is essential. The soil should be well manured and very firm. Sow in rows 1 ft. apart, and thin out to 4 in.

Parsnips.—See *Beet*.

Peas.—Rich soil suits peas well. Dwarf varieties need no sticks. Early peas are much attacked by birds, and need protection. Dress the seeds with red lead before sowing if mice are troublesome. Sow in rows 4 ft. apart (or less, according to kind), and occupy intervening spaces with quick-growing salads, &c.

Potatoes.—Plant the "sets" 1 ft. apart, with 2 ft. between the rows. Potatoes need to have the earth drawn round them with the hoe when the young tubers begin to form spears. Spray twice during the season with Bordeaux mixture.

Radishes.—Sow in rich ground and give plenty of water.

Rhubarb.—Rhubarb may be treated in much the same way as Seakale (see *below*). In March (or a little later in northern counties) the uncovered plants may be mulched with manure, and afterwards heavily watered with liquid manure to force the growth on. To obtain early crops, the plants should be manured the previous summer, and about January the crowns may be covered with pots or barrels, and hot manure stacked outside. The earliest rhubarb may be forced over pipes in a greenhouse.

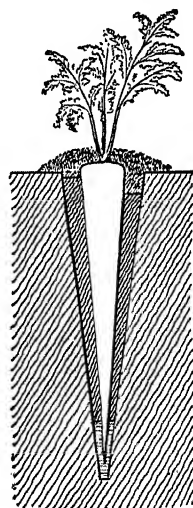


Fig. 34.—Section showing Method of growing Parsnips and Carrots in Heavy Ground.

Seakale.—Plant cuttings 3 to 6 in. long, taking pieces of about the thickness of a stout pencil from the old roots, and cutting the part nearest the stem quite level, and the other end slanting, so as to distinguish the top. Store these cuttings in boxes of dry soil in a place free from frost. When, by early spring, the cuttings show numerous little heads, all but the two strongest should be removed. The plants should then be put in, in rows $1\frac{1}{2}$ ft. apart, allowing 12 in.

Blanching Seakale.—In the absence of special seakale pots, blanching may be done by placing boxes, large pots, or handlights over the crowns of the plants in the open air. Even heaps of leaves will serve the purpose. A very little light may be admitted to give colour to the tips of the plants. Open-air plantings of seakale will continue year after year, if well-rotted manure be forked into the soil each spring, so that plenty of foliage is formed during summer to strengthen the



Fig. 35.—Seakale

between the plants themselves, and covering the crowns with fine soil. Finally, one only of the shoots should be left to each crown.

If plants are to remain for a number of years in the same place instead of renewing them annually, more space will be needed to give sufficient light and air, and to allow for forking the ground between. Where it is necessary to raise plants from seed, instead of from cuttings, sow the seeds in drills 18 in. or 2 ft. apart and thin the young plants finally to 1 ft. asunder in the rows.

When the leaves die away in the autumn, clean the plants and cover the crowns lightly with ashes or sand. This should be removed in spring; and the process of blanching then begins.

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plant. Care must be taken later to remove flower stems if they appear, as these have naturally a weakening effect. If there is a warm greenhouse available, roots may be lifted from December onwards, and brought on quickly in the dark for good early crops.

Spinach.—Sow in drills 1 in. deep and 1 ft. apart. Cut when ready, and leave bases for second and even third crops.

Tomatoes.—Tomatoes may be successfully grown out of doors by sowing early under glass, pricking off, and transplanting. The culture is similar to that of those grown under glass. They should be hardened off gradually. Pinch out all laterals, and, when the plants have made three bunches of bloom on a single stalk, stop the main stem. Remove only such leaves as shade the fruit that is

beginning to change colour, and continue to pick off all lateral shoots. Tomatoes should be supported by being carefully, but not tightly, tied to firm sticks. The crop should be richly fed, but avoid rank animal manure.

Turnips.—Dress with soot, and water freely in hot weather to keep off the fly. Thin out to a distance of 8 in.

Salsify (the "Vegetable Oyster") and *Scorzonera* should be sown in rows 15 in. apart, being careful to let no manure come near the roots, but putting it simply at the bottom of the trenches, as for beetroot.

Zea Mays.—Maize or Indian corn forms an excellent vegetable if the "cobs" be boiled when ready. Plants raised early should be planted out two or more feet apart in rows, and merely kept clean for autumn cropping, when a proportion of the crop can be bottled for winter use if desired.

Cultivation of Salad Plants

The small variety of salads which figure in the dietary of English people may be caused by an erroneous idea that raw vegetables are unwholesome. Wholesomeness depends to a considerable extent on the skill with which vegetables are grown. And the important point, therefore, is so to understand the cultivation of salad plants, that those used may be gathered in a tender, crisp, and succulent state. Among some of the lesser-known salads which deserve to hold a higher place than is accorded them on the English *menu*, the following plants may be mentioned:

Celeriac.—Celeriac, otherwise known as Turnip-rooted Celery, which is so well utilized in French cookery, has a real usefulness as a salad plant. Sow seeds as for celery about the month of February, and plant out on the flat about 10 in. apart in rows, which should be 18 in. from each other. The soil should be drawn away from the stems as they begin to swell, and be drawn up again when approaching maturity in order that they may be properly blanched. The making of trenches is, however, quite unnecessary, since it is the root and not the elongated stem which will be eaten. Celeriac

may be stored in a dry cellar during the winter months.

Chicory.—To grow this as a salad plant, sow the seeds out of doors in April, and thin the seedlings to 6 in. apart. Lift the plants the following winter, and after putting in pots or boxes, keep them in a warm, dark place, moistening when necessary overhead and at the roots. By this means the leaves will blanch quickly.



Fig. 36.—Chicory

Corn Salad.—Corn Salad or Lamb's Lettuce is a most useful substitute to follow ordinary lettuces. Seed can be sown from August to October in drills 9 in. apart, in any good garden soil, for salads for spring use; and again, if needed, in March or April. Thin the plants to at least 4 in. apart, transplanting the thinnings if desired.

Dandelion.—This is another ingredient, neglected in English salads. The roots as well as the leaves may be used. Blanching improves the flavour of the latter, and, except that the flowers should be removed as they appear, the cultivation of dandelion requires no special comment.

Endive.—The culture of Endive, or Christmas Salad, resembles that of chicory. The plants may be blanched by putting thin pieces of slate over their centres, or by lifting them and placing them in the dark. The leaves of endive can also be cooked and eaten as winter greens.

Salsify.—Salsify, the Vegetable Oyster, may be raised from seeds sown in shallow drills in April, 15 in. apart. Thin the young plants to at least 4 in. apart in due course. The leaves may be eaten as salad and the roots boiled and stored for winter use.

Scorzonera.—This is cultivated in the same way as Salsify.

Sorrel.—This plant imparts a pleasant piquancy to a mixed salad. If sown in drills in spring, and thinned to 6 in. apart, it will supply leaves during the greater part of the year, provided care is taken not to cut all the foliage from one plant at once.

Watercress.—If the cultivation of watercress is attempted in private gardens, running water should be available. If not, an extremely moist situation should be chosen, and the crop constantly watered. The seeds may be sown in March or April, or cuttings put in.

Young Onions.—Onions are useful for flavouring salads, and a regular supply should be ensured by sowing the seed broadcast in small beds from March until August. If only two sowings are desired, these should be made in March and August, and should be sown in drills 6 in. apart. The seedlings may be pulled up and used as soon as three leaves are visible upon them.

The Herb Garden

No kitchen garden can possibly be complete without its plot of Sweet and Pot Herbs for the seasoning of dishes and the spicing of drinks. The following notes on their cultivation will be found useful:

Angelica (*Angelica officinalis*).—An Alpine perennial with hollow stems, this herb is interesting to cultivate. Stock can either be obtained from plantations in the first place, or from sowing seeds in March and April, or in the autumn.

Balm (*Melissa officinalis*).—Balm will flourish in any ordinary soil. Propagate by cuttings, and remake beds annually. This herb is used especially for seasoning drinks.

Borage (*Borago officinalis*).—This plant is a hardy annual which grows from 1 ft. to 1½ ft. in height, with rough oval green leaves and pretty blue flowers. It is familiar for its use in cups and cordials.

Chervil (*Anthriscus cerefolium*).—This is one of the most useful of the little-known salad herbs. Sow the seeds any time from March until August, and thin the plants out to 6 in. apart each way.

Dill (*Peucedanum graveolens*).—Though an annual, dill greatly resembles fennel. Seeds are used as a condiment, for pickling, and for flavouring.

Fennel (*Fœniculum*).—This well-known and graceful race of perennial plants, aromatic and carminative, is easily cultivated in a sunny situation. The leaves are familiar for seasoning and garnishing; the seeds are used for liqueurs, &c.

Lavender and Rosemary.—Both of these may be considered as delightful ornaments for the vicinity of the kitchen if large tubs are available in which to grow these shrubs, which are too well-known to need description. The same may be said of *Bay Trees*, leaves of which are of course always required in cookery.

Marjoram.—This herb may be propagated by cuttings or sown under glass in April or May. The pot marjoram is a perennial of small and shrubby habit, and is more suitable for cultivation in boxes (see below) than the taller variety. It is increased by division of the tufts or by cuttings in summer.

Mint and Spearmint (*Mentha viridis*).—The tender juicy tips of this herbaceous perennial are too well known to need description. Cut the stems down to the ground each autumn, and give a dressing of manure to encourage

fresh growth in spring. Mint can be grown in any soil, and even in boxes on a window ledge. It is, however, liable to attacks of a "rust", a fungoid disease, and in the case of a serious attack it is necessary to burn the plants and make a fresh start from healthy stock.

Parsley.—Parsley should be sown in April. It will often be found fickle in germinating, indeed there would seem some truth in a tradition that parsley goes seven times to the Devil and then comes back again! Plants should be put in at least 6 in. apart, and the soil be made up good and rich, and kept stirred over the surface between the plants. If a supply of parsley is wanted in the winter it should be grown in a cold frame in a sheltered part of the garden.

Pennyroyal (*Mentha Palegium*).—The cultural treatment is similar to that of Mint.

Sage (*Salvia officinalis*).—This well-known little shrub has woolly grey leaves which are used for "stuffing" in combination with onions. A sunny situation suits the plant, which likes to find a mixture of mortar rubble in the soil. In order to increase, cuttings or "slips" are taken from the half-ripened wood and put in in a shady situation. Transplant when rooted.

Thyme (*Thymus vulgaris*).—The foliage

and young shoots are used for flavouring. Thyme makes a good edging to a small garden plot. The Lemon Thyme should also be cultivated. Both subjects are increased by cuttings or seeds

The Kitchen Window Box

The making and care of window boxes need call for few remarks here, but a use for the kitchen window box might more often be found than is certainly the case. Where garden space is scarce, some of the smaller pot-herbs, such as parsley, may be grown to advantage, and a pleasant spot of green be ready to meet the eye for a large part of the year in addition to the advantages of having a practically continuous supply of certain fresh herbs for culinary use.

It very often happens that the plants in window-boxes present a somewhat sad appearance. This is generally through a misunderstanding as to treatment. Let the boxes be properly drained by making holes at every foot or so of distance, and covering these with broken crocks. The inside of the box should be tarred, not painted, and a slight slope should tend to drain away superfluous moisture. Never allow the soil to be pressed down, or to become either sodden or dried up.

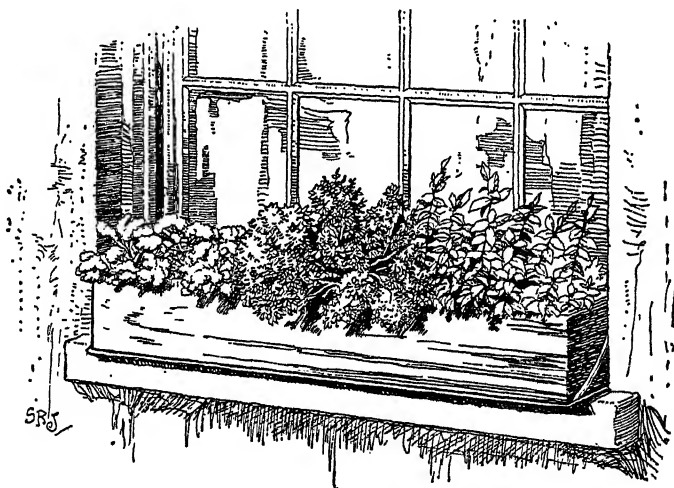


Fig 37.—Kitchen Window Box with Parsley, Thyme, and Mint

THE FRUIT GARDEN

Proper Succession of Fruit

For a proper succession of fruit, early, main-crop, and late varieties should be grown. By means of south and north walls, the fruiting of early and late varieties can be prolonged further. Red currants, for instance, if trained on a north wall and protected by nets from the birds, ripen later and hang some weeks longer than those grown in the open. On the other hand, in warm sunny ground under a south wall, strawberries will be ripe in May, while later varieties on the north side may be kept back till late in July. In the same way it is possible to gather raspberries continuously from July to the end of September. The following table will show when the different fruits should be procurable if a proper method of succession be carried out.

The Fruit Garden Beautiful

When planning a garden, let it be remembered that fruit trees, rightly placed, cannot fail to contribute to its beauty as well as usefulness. These may form an orchard in the home grounds, a modest plantation in connection with the ordinary kitchen garden, or they may constitute individual elements in the landscape—such as a cherry tree on a lawn within sight of the house.

Trees for Shelter

To come to more utilitarian considerations in the fruit garden, an opinion may be quoted here with regard to *trees for shelter*, on which subject a well-known authority has truly said that “the best trees to plant round an orchard for shelter are damson, bullaces, and nuts”. The same writer has

TABLE OF SEASONABLE FRUITS

(Each month during which a fruit is in season is marked with a ×)

Fruit.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Apples	×	×	×	×	×	×	×	×	×
Apricots	×	×
Blackberries, logan-berries, &c.	×	×	×
Bullaces	×	×	×	×
Cherries	×	×	×	×
Currants (black)	×	×
Currants (red)	×	×	×
Currants (white)	×	×
Damsons	×	×
Figs	×	×	×	×
Filberts, cobnuts, hazelnuts, walnuts, &c. .. .	×	×	×	×
Gooseberries	×	×	×	×
Grapes (out-door)	×	×	×	..
Grapes (in-door) ..	×	×	×	×	×
Greengages	×	×
Nectarines	×	×
Peaches	×	×	×
Pears	×	×	×	×	×	×	×	×	×
Plums	×	×	×
Quinces	×	×	×
Raspberries	×	×	×
Strawberries	×	×	×
Strawberries(perpetual)	×	×	×	×	×	×

added the advice: "Plant a filbert or cobnut between every damson and bullace, and in two years there will be a perfect hedge. Bullaces and damsons, being very hardy, invariably bear good crops of fruit, and they make delicious puddings and pies; and wine nuts are quite as useful too."

Planting of Fruit Trees

As fruit trees do not begin to bear until they are three or four years old, it is far better to purchase than to attempt to raise them. Ground for planting should be trenched to a depth of two feet, well manured, and the trees planted so that surface-rooting is encouraged (see fig. 39). Trees are sometimes planted with a slate under the roots to force them into a lateral rather than a vertical direction, so that they may find the richest food if the soil be deep but poor. In such cases the roots should be well soaked in water before being planted. Prune away broken fragments, and arrange the roots horizontally and regularly, covering them with good soil of fine texture, procured if necessary for the purpose.

Shake the tree gently as each layer of roots is covered. It is most desirable to stake *before* instead of after planting, so as not to injure the roots. Press the earth firmly about the tree and mulch the surface with manure as a protection against frost and drought. November, if the weather be open, is the best month for planting, an operation which is carried out more efficiently by two people than by one alone.

Mulching

Mulching is so important that it deserves special mention. All kinds of trees and plants are the better for it. Rotten manure, straw, litter, leaves, or any similar substance will answer the purpose, and should be spread on the surface under which the rootlets are running in spring. Water and special dressings are then applied through the mulch, which retains warmth and moisture,

and at the same time hinders scorching of roots in trying weather.

Pruning

When a young tree is established, it requires systematic pruning. Every summer it forms leaf-shoots and in time fruit-spurs. The object of pruning is to encourage the formation of the latter, and to ensure a proper shape. The method adopted depends upon the object aimed at—whether the tree be a standard, a cordon, or an espalier.

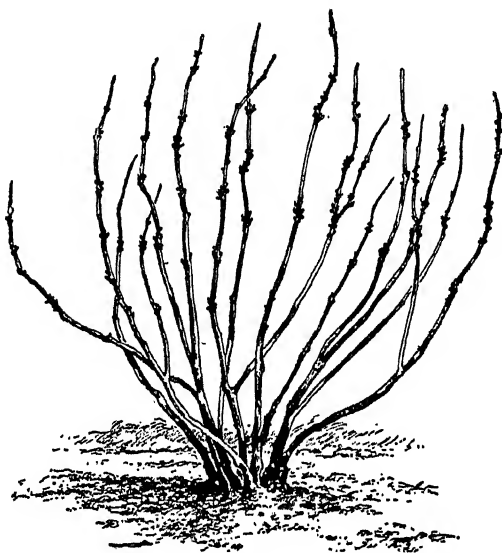


Fig. 38.—Well-shaped Pruned Red Currant Bush

Orchard trees require but little beyond thinning the growths and cutting out dead wood. Apples, pears, and, to a modified degree, plums and cherries, are pruned on the "spur" system, because fruit is borne upon wood of, say, three to five years of age. Peaches and nectarines, on the contrary, fruit upon the new wood.

Currant bushes require pruning in September. The red and white currants should have the leading shoot on each stem cut back to a length of six inches, all side shoots being shortened to two inches. All shoots from the root, or suckers, should be removed at the same time, unless it is desired to leave one or two to replace worn-out stems. Fruit bushes, and especially currants, should be

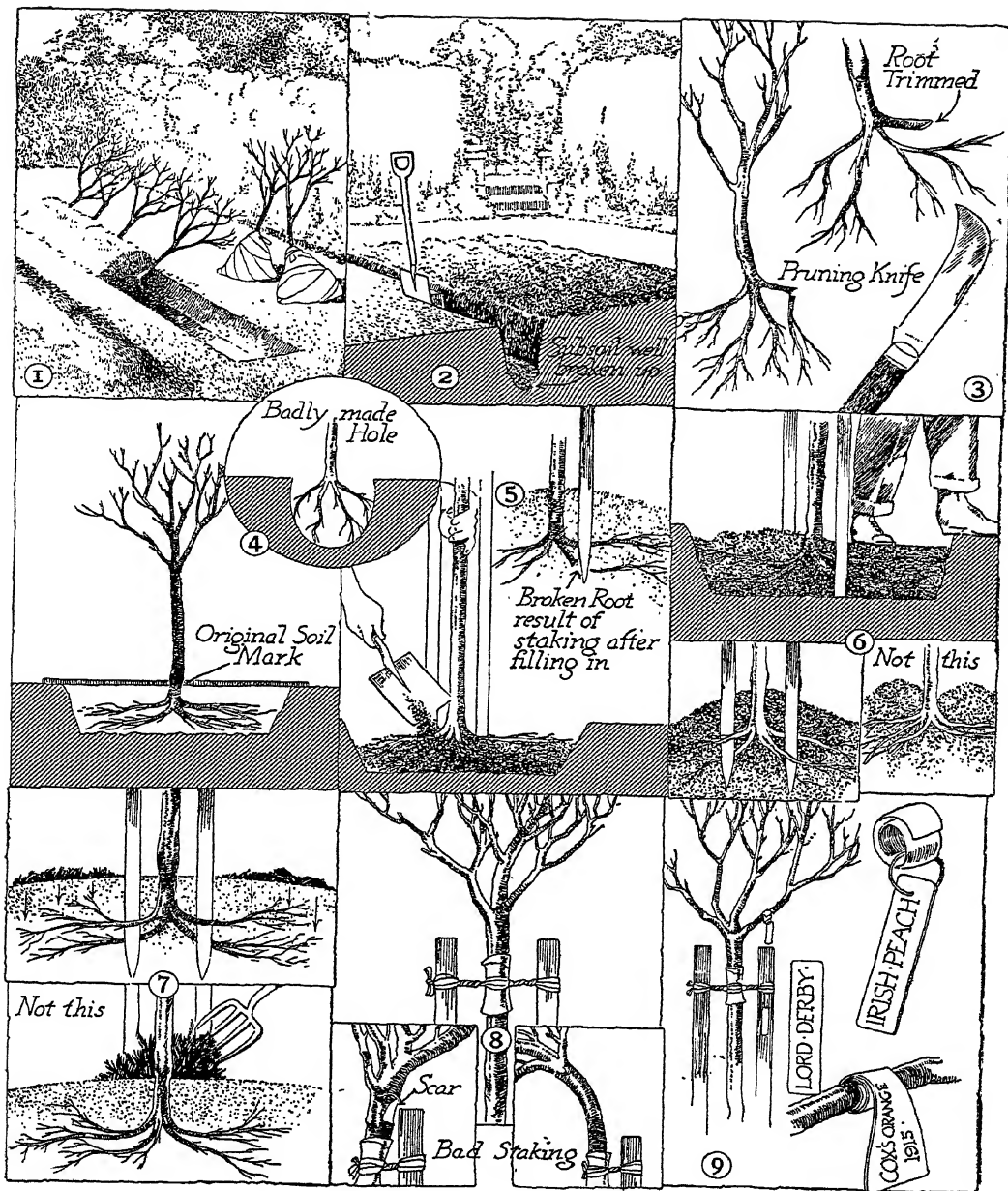


Fig. 39.—How to plant Young Trees

1. If not planted at once, cover roots firmly with soil in sheltered position. Roots which have suffered from drought in transit should first be plunged for a day in tepid water. Do not plant in frost. 2. Thoroughly break up the subsoil. Well-decayed manure should be incorporated with upper soil only, to avoid contact of manure with actual roots. 3. Trim broken roots to prevent rotting away, and to encourage formation of new root fibres. 4. Plant tree to its original soil mark in a hole which is dug *wide* as well as deep. 5. Hold the tree upright and shake slightly to "settle" while the soil is worked round the roots. This is best done by two persons. To avoid damage to roots place stakes before filling in with soil. 6. Tread in each layer of soil gently but firmly. Mount last layer slightly above surface level to prevent water from collecting round the tree. 7. Manure should be spread evenly over surface. 8. Make the tie firmly with tarred twine. A piece of rubber hose, or other vermin-proof material, should first be placed round the stem to avoid bruising. 9. Examples of name plates whose fastenings expand as the branch thickens.

kept well open in the centre, so that the air can circulate among their branches (see fig. 38). Black currants fruit on the wood made the previous year, so that pruning in their case should be confined to thinning the shoots and shaping the bush. Gooseberries require the same treatment as red currants.

Grafting

The operations of budding and grafting have a peculiar interest for the amateur gardener; and indeed there is a certain fascination in being able to combine different varieties of trees or plants to their own advantage, and occasionally even, by a happy combination of stock and scion, to accomplish something really worth while in the direction of horticultural progress. A single form of grafting only—that of tongue or whip grafting—will be described here, for while the subject is sufficiently large to fill an entire treatise, one example will demonstrate the method, and this can then be adapted at will.

In grafting, as distinct from budding, the entire shoot is detached from the species it is intended to perpetuate, which, of course, must be related to the stock on which it will be rooted.

Kinds of Stock

The kind of stock will, naturally, vary with the fruit or flowering tree in question. Thus, pears are generally grafted on the quince or “free”, i.e. the pear stock, apples on the “free” or crab stock if great vigour is desired, whereas the “paradise” stock is used if restricted growth and early fruiting are necessary. Roses are, of course, grafted on the wild briar; hybrid rhododendrons, which now exist in such beautiful varieties, on the old mauve-coloured *Rhododendron ponticum* of the woods; and so on.

Getting ready Stocks and Scions

The stocks, if not already growing in the garden, should be obtained from a reliable source, and they may be laid in the ground, if convenient, the previous autumn. As the stocks should preferably be growing quicker

than the scions, it is well to check the exuberance of the latter by taking them off a month before operating and laying them in soil in readiness for use. Any time during March may be suitable for the operation of grafting; but if the weather be unpropitious or the garden a northerly one, it is best deferred to the end of that month or the first fortnight of April.

Cut the stocks over at the point where the graft is to be made, i.e. near the base for bushes, pyramids, &c., or at the appropriate point in order to produce a standard tree.

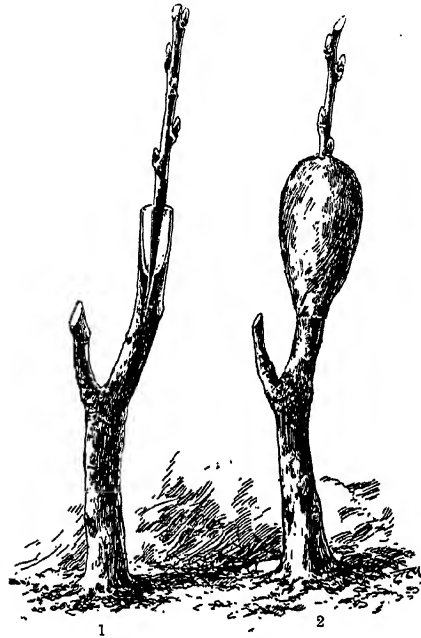


Fig. 40.—Cleft-grafting

1, Scion inserted in stock; 2, the joint covered over with resinous mixture or grafting clay.

How to Graft

Making use of a sharp budding knife, cut smoothly upwards along the back of the stock, letting the cut be of the same width as the graft it is proposed to insert, and about $1\frac{1}{2}$ in. long. Then make a slanting cut in the opposite direction, starting at the top of the slice and carrying the knife behind it so as to leave a slit $\frac{1}{4}$ in. deep for inserting the “tongue” (fig. 40). Next

prepare the graft or scion by shortening the shoot chosen to about 4 in. Cut the lower end to fit the smooth part of the stock where the bark was removed, and cut the tongue

Fit the two portions together, making both the inner edges join neatly if the size of the branch grafted allows of this; the outer side will do so in any case. Bind firmly with

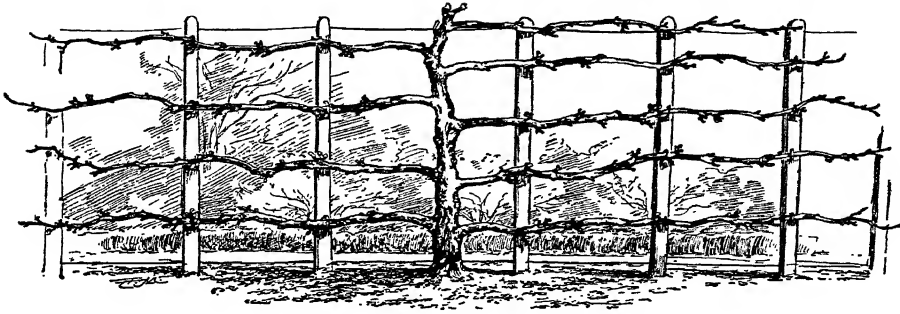


Fig. 41.—Fruit Tree trained as an Espalier

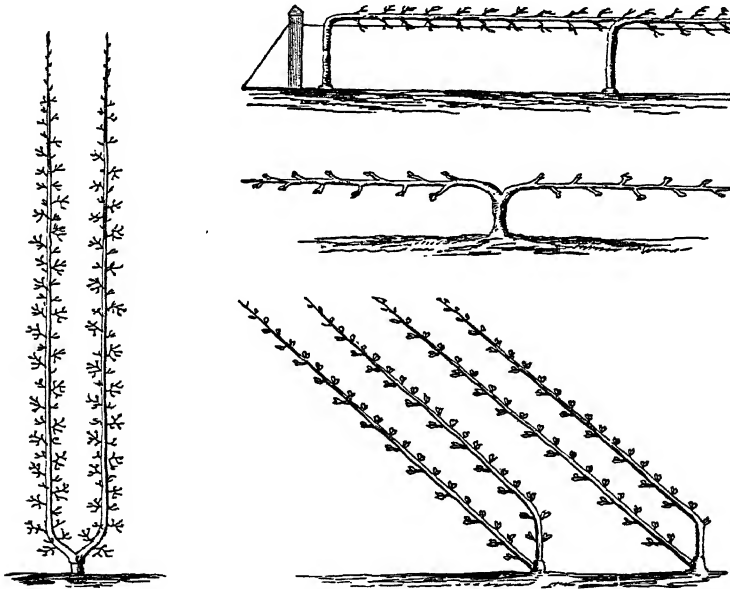


Fig. 41a.—Methods of training Cordons

(fig. 40) also carefully by making a slit which will enable it to fit properly, for on accurate joining will depend the running together of the sap and the consequent success of the whole operation.

raffia, taking care to allow no shifting at this point, and cover the place of the graft with wax procured for the purpose, the best brand of which is, perhaps, that known universally as Mastic l'Homme Lefort.

Grafting clay, composed of soil and cow-dung, can easily be made at home if the amateur gardener is so disposed.

Training Fruit Trees

The principal methods adopted for wall fruit trees are the fan, horizontal, oblique, and cordon; in open ground, espaliers, pyramids, bushes, and standards are the shapes usually grown. At one time it was the fashion to grow large standard trees, but—except for orchards—bush or dwarf



Fig. 42.—Dwarf Tree on Paradise Stock

trees (fig. 42) now find favour. They are especially suitable for an amateur's garden, as a heavy crop is more speedily obtained, and the trees are neat and compact, besides which they can be set so much more closely, a greater variety being thus grown on the same area. Fan training, horizontal training, and oblique training are illustrated and described in figs. 43 to 46. Fan training, or some modification of it, is generally adopted for stone-fruits, such as the peach, apricot, cherry, and plum. Horizontal training is largely employed for pear trees and sometimes for apples, both on walls and espaliers. Fig. 41 shows this

method of training as applied to espaliers, which are most to be recommended for dividing one section of the garden from another.

The pruning is the same as that recommended for other kinds, except that the leading shoots are allowed to run as far as may be required and are then stopped. Oblique training is suited for weak-growing varieties. Cordons are grown on single stems, which may be either upright, horizontal, or oblique, as illustrated in fig. 41a.

Gooseberries may be grown with success as cordons, also red and white currants, e.g. at the edges of plots.

Good Varieties of Fruit Trees

(See p. 60.)

Strawberry Culture

Strawberries do best in a nice warm situation with a strong soil; if a succession be desired, the early varieties should be planted in a warm corner under a south wall, and the later kinds in a more exposed position. As soon as the plants have fruited, the runners, if not wanted for propagation, should be cut off, and the crowns encouraged to ripen. Strawberries should be heavily mulched in the spring, and in dry weather they are the better for being given plenty of stimulant mixed with the water. When the fruit begins to form, clean straw should be laid over the manure in order to protect the berries from dirt and splashing. When making a selection for a new bed, always take the first runner (i.e. the one nearest the parent). If these plants are carefully dug up with a trowel, and planted in rows in August, they should produce fruit the following year. The best strawberries are grown on plants from one to two years old. After the third year these should be replaced with young plants.

Vines

Grapes can be grown either in the greenhouse or against a warm wall out of doors. It is important, however, to cultivate the kind most suitable for the special purpose.

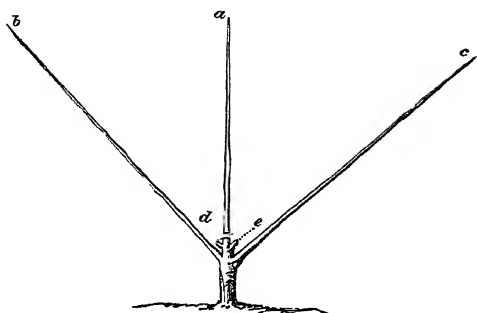


Fig. 43

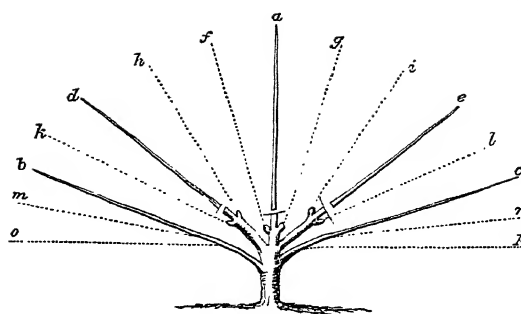


Fig. 44

Fan Training

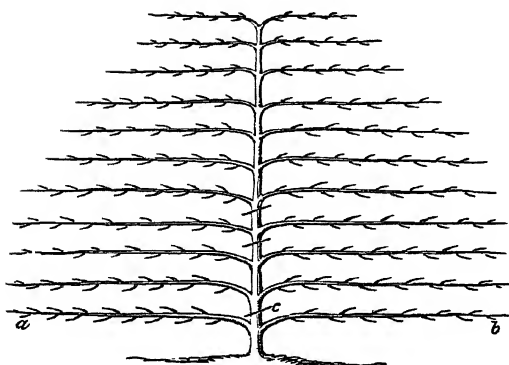


Fig. 45.—Horizontal Training

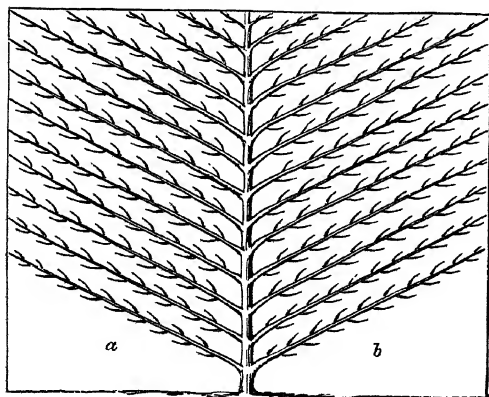


Fig. 46.—Oblique Training

Fan Training.—This method of training may be started as in fig. 43, where the tree is supposed to have made its first three shoots. At the winter pruning, *a* is cut over above three suitably situated buds, one to form a new upright leader, the others, *d* and *e*, to give rise to two side branches at a later stage (fig. 44). *b* and *c* are lowered, their place being occupied by the two new shoots from *d* and *e*. These in turn are shortened above buds which give rise to the branches *h*, *l*, *h*, and *i*; while the leader, cut back at the same time, produces from the buds below this cut two shoots, *f* and *g*.

Horizontal Training.—Fig. 45. When the young plant consists of a single upright shoot or stem, it is cut down, as at *c*, above three buds, situated at the proper height for originating the two lower horizontal branches, *a*, *b*, and the third one for the upright leader. The branches *a*, *b*, are first trained at some elevation, in order to promote free flow of sap, but are afterwards bent down. At the next winter pruning the distance between the courses of horizontal branches being determined, two buds, one on each side, a little below that distance, are selected, and at one bud above these the upright shoot is cut over. These three buds give rise to a second pair of horizontals and an upright stem. By continuing the same method all the horizontal branches are successively originated.

Oblique Training (fig. 46) is similar to horizontal training, the only difference being that the branches are induced to start upwards.

An attempt, for instance, to grow Muscatel grapes in an ordinary "lean-to" would probably result in failure. For that purpose the best sorts are Black Hamburgh and Sweet-Water.

The roots should be planted in an outside border, and the stem brought inside the greenhouse. Water freely, but never make the ground too moist. Occasionally give liquid manure composed of $\frac{1}{2}$ oz. of Peruvian guano dissolved in 1 gall. of water, especially after the grapes swell and change colour; but as it is a strong manure it must be used as sparingly as indicated.

Pruning the Vine

The pruning of vines (fig. 47) is important. It should mainly be done in the autumn. If delayed till spring, when the vines are full of sap, they are likely to "bleed". Two stems only should be retained to each plant, the length depending on the amount of roof space. If one of them shows signs of exhaustion, another should be trained up to take its place, the old stem being cut away when the new one is strong enough to bear. When pruning, shorten all laterals, leaving only three or four buds. Thin out the shoots that start in the spring, selecting for growth one on each spur, and "stop" it by cutting back beyond the first bunch. The bunches too will need much thinning

if the grapes are to swell properly, and any bunches that attain a considerable size should be supported by ties of raffia. Sunshine and plenty of air are essential to the proper colouring of the grapes.

General Care of Vines

Syringing should be done frequently. It is also advisable that the vines should be thoroughly painted with strong soap-suds when all the leaves have fallen. If a small quantity of sulphur is added to the water, it will help to destroy any larvæ of insects.

Mildew, the commonest disease among vines, is usually the result of defective ventilation. The pest should be treated with sulphur, which can be either carefully dusted over the leaves, or sprinkled on the hot-water pipes. In the case of an attack of green-fly, fumigation will be necessary. The simplest method is as follows: Obtain an ordinary old tin bucket and make a few holes in the bottom and sides for draught. Inside this place a few red-hot coke cinders and upon them a loose layer of tobacco-paper. Keep on adding paper and inducing it to smoke freely until the house is so full that the floor would be invisible if the operator stood upright. Syringe heavily the next morning. It is absolutely essential to see that the tobacco-paper does not flare, otherwise it will injure the foliage.

GOOD VARIETIES OF FRUIT TREES

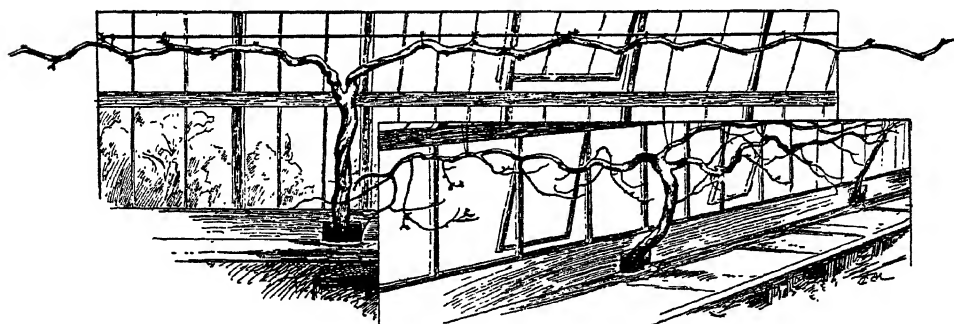
DESSERT APPLES.	SEASON.
Gladstone	July and August.
Irish Peach	August.
Devonshire Quarrenden ..	August.
Beauty of Bath	August.
Worcester Pearmain	Aug. and Sept.
James Grieve.	Sept. and Oct.
Redcoat Grieve (new) ..	Sept. and Oct.
Blenheim Orange	Nov. to Jan.
Allington Pippin	Nov. to Feb.
Cox's Orange Pippin	Nov. to Feb.
Coronation	Nov. to Feb.
King of Tompkin's County	January to May.
Cockle Pippin	February to April.
Duke of Devonshire	February to May.
Sturmer Pippin	March to May.

COOKING APPLES.	SEASON.
Stirling Castle	Aug. and Sept.
Lord Grosvenor	Aug. and Sept.
Peasgood's Nonsuch	Sept. to Nov.
Ecklinville's Seedling ..	October.
Warner's King	Oct. to Dec.
Beauty of Bath	Oct. to Feb.
Lane's Prince Albert ..	Oct. to Feb.
Blenheim Orange	Nov. to Feb.
Wellington (Dumelow's Seedling)	Nov. to March.
Sandringham	Dec. to March.
Mère de Ménage	Dec. to March.
Bramley's Seedling	Jan. to March.

PEARS.	SEASON.
Jargonelle (standard or pyramid—a stewing pear) ..	August.
Clapp's Favourite	Mid-August.
Williams' Bon Chrétien ..	Aug. and Sept.
Beurré d'Amanlis (Back-house's Beurré)	September.
Pitmaston Duchess (pyramid)	October.
Beurré Hardy	October.
Louise Bonne of Jersey (pyramid)	October.
Bergamotte d'Esperen (wall or pyramid)	October.
Conseiller de la Cour ..	Oct. and Nov.
Durondeau (pyramid) ..	Oct. and Nov.
Conference (pyramid) ..	November.
Winter Nelis	Nov. to Feb.
Beurré Diel (wall or orchard)	Nov. and Dec.
Doyenne du Cornice ..	Nov. and Dec.
Beurré d'Anjou (Beurré Gris)	December.
Catillac (stewing)	Dec. to April.
Easter Beurré	Jan. to March.
Uvedale's St. Germain ..	Jan. to May.
Olivier de Serres	Feb. to March.
Beurré Bosc (wall)	Feb. to April.

PLUMS.	SEASON.
<i>Dessert.</i>	
Rivers' Early Prolific ..	Late July.
Czar	Early August.
Early Orléans	Early August.
Greengage	End of August.
Jefferson	Early September.
Kirke's	Mid September.
Coe's Golden Drop ..	Late September.
<i>Kitchen.</i>	
Belle de Louvain	August.
Belgian Purple	Mid-August.
Victoria	September.
White Magnum Bonum (pre-serving)	Early September.
Monarch	Late September.
Damson, Bradley's King ..	Sept. and Oct.
Bullace, The Langley ..	November.

CHERRIES.	SEASON.
Early Rivers	June.
Knight's Early Black ..	Late June.
May Duke	July.
White Heart	July.
Black Heart	Early July.
Frogmore Early Bigarreau	Early July.
Morello	August.
Late Duke	Late August.



Vine properly pruned

Neglected vine

Fig. 47

ORCHARD AND GARDEN PESTS

In the Orchard

A short list of the most familiar of the small pests that attack fruit trees would include the apple-blossom weevil, American blight, the apple sucker, apple mussel scale, the lackey, small ermine, vapourer, and winter moths, the pear midge and the pear-leaf blister mite, the big-bud mite, the gooseberry sawfly, and various beetles.

Beetles and Weevils

The apple-blossom weevil is in nearly every orchard; it is only a quarter of an inch long and is rarely seen, but the grubs produce the well-known "capped" blossoms, which never result in apples. Tits are fond of the weevil, and should be encouraged to come and nest in the trees. The insects often hibernate on the trees, so any of the advertised winter washes may be used on the bark, and all rubbish heaps should be cleared away. Bands of sacking also are useful traps, for many weevils will take refuge in them. Another familiar pest is the nut-weevil; the chrysalides are in the soil during the winter, and a good remedy is to cultivate the soil well and also to add fresh mould, together with manure.

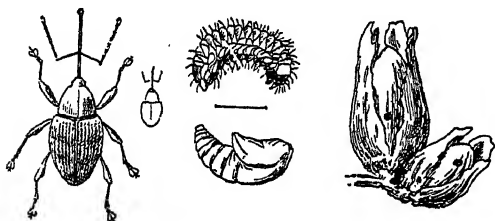


Fig. 48.—Nut Weevil, Larva, Pupa, and Damaged Nut

Moths and their Larvæ

The much dreaded *codlin moth's* larvæ produce "maggotty" apples; the apples fall before they are ripe, and each has a little mark of discoloration on the lower part; this mark is really a tiny hole opening into a passage, at the end of which, in the centre of the apple, the larva is feeding. The

larvæ spend the winter in cracks in the bark or inside dead leaves. The trees should be scraped and washed, and sprayed with soft soap and sulphur. Banding is also useful; this should be done about June, with old sacking or hay-ropes. The larvæ of the

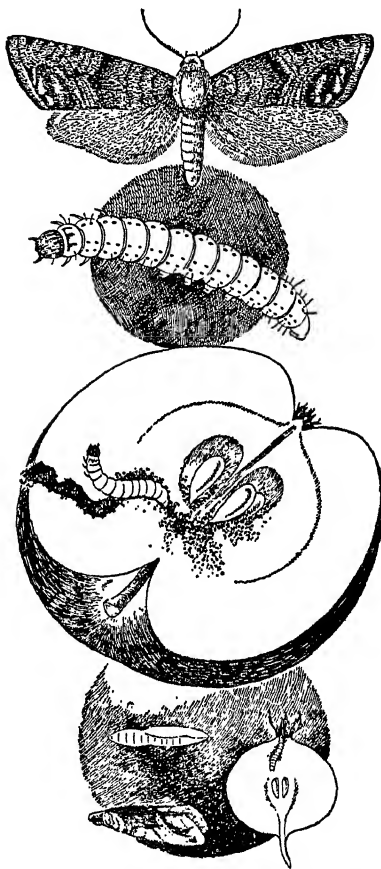


Fig. 49.—Life-History of the Codlin Moth

lackey moth attack nearly every tree in the orchard; the hairy, brilliantly coloured caterpillars appear in April and feed in webby nests amongst the leaves. These nests should be destroyed, as well as the egg-bands that will be seen on the trees all the winter.

The *vapourer moth's* larvæ are found during the summer; they are so conspicuous

in their red, brown, and yellow colouring that they may be hand-picked with advantage. Not only do they attack fruit trees, but conifers and garden and greenhouse plants. Small *ermine moths* are present in most gardens and orchards, and, though there are two or three distinct species, their habits are much the same. The species harmful to orchard trees is *Hyponomeuta padella*; it is found on apples, pears, plums, and cherries, often stripping off the leaves and seriously weakening the trees. The history of the insect is curious. The eggs are laid towards the end of the summer, and the larvæ hatch out in the autumn, hiding themselves during the ensuing winter under their egg-shells and rubbish that is blown on to the shells and adheres. Winter washes have been tried in order to dislodge and destroy the tiny larvæ, but these have not been very successful; a good paraffin emulsion, however, might be tried, made as follows: one gallon of paraffin, one and a half to two pounds of soft soap, and ten gallons of water. "Cook's" caustic winter spray would also be useful, as it thoroughly cleans the bark, destroying all moss and penetrating into minute cracks.

Winter Moths

The caterpillars of the winter moths do an enormous amount of damage to all sorts of trees, except conifers. The moths are: the *mottled umber*, the *March moth*, and the *winter moth*. The damage is done by the larvæ in the spring. All the females are wingless, or nearly so, and therefore may be caught by grease-bands as they ascend the trunks of the trees from the ground where they have pupated. It should be noted that, neither oily nor sticky bands should actually touch the trees, but that the bark should be protected by thick paper. Or the bands, about nine inches wide, should be tied on firmly, and the greasy or sticky composition applied afterwards, keeping it always about two inches from the edges, so as to prevent its reaching the bark. Another good plan is to take off the surface soil when the caterpillars have gone down to pupate, or to

shake the trees to dislodge them while they are feeding.

Pear-Tree Pests

The *pear-leaf blister mite* measures only $\frac{1}{100}$ in., and its presence is detected by



Fig. 50.—Ladybirds laying Eggs on a Rose-bush infested with Green Fly

pimples or blisters on the leaves; the danger becomes acute when the tree is so badly infested that the fruitlets and the stalks are attacked. Apples and garden plants are also very frequently injured. Its life-history is full of involved and curious details. During the winter it shelters under the bud-scales, and when spring comes it moves on to the young leaves, where it makes burrows on the under surface. In these burrows the eggs are laid, and at the same time the upper surface of the leaf shows blistering. Further blistering is caused by the fresh burrows made by the mites when they hatch out. All the summer the mites are reproducing, and when the leaves fall they retire to the scales of the buds for shelter. Not only are the leaves injured, but the mites attack the fruitlets and stems. This life-history shows that spraying will be the best remedy, carried out in November (after the leaves have fallen) or in the early spring before the buds begin to open. The home-made paraffin oil and soft-soap emulsion is excellent. Of

course, hand-picking of infected leaves should be carried out in small gardens.

Another pear-tree pest is the *pear midge*, and an indication of its presence is the distorted appearance of the young fruit, which drops when about the size of a marble. If one of these fallen fruitlets is cut open, a number of tiny, creamy white maggots will be found, with their black excreta amongst the softened pulp. The midges themselves appear in spring, but they are very small, have very short lives, and are rarely seen. The best remedy is to turn poultry under the trees during the months of April, May, and June; the birds will catch the midges as they come out of the soil, where the maggots pupate. Also fork over the soil under the trees.

American Blight

A good remedy for *American blight* is "Cook's" nicotine spray. This is also excellent for attacks of *psylla*, *scale*, and *capsid bugs*. Moss and lichens should be cleared from the bark. This pest is found generally amongst neglected apple trees, and when these are very old nothing is better than an application of tar; for younger trees use instead soft soap, which will choke the insects.

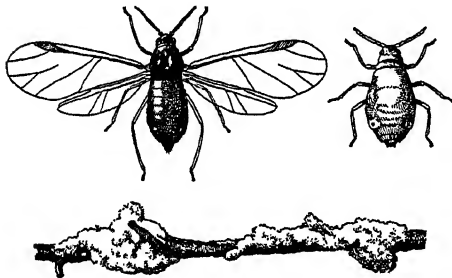


Fig. 51.—American Blight (*Woolly Aphis*)
Winged and wingless female and infested twig

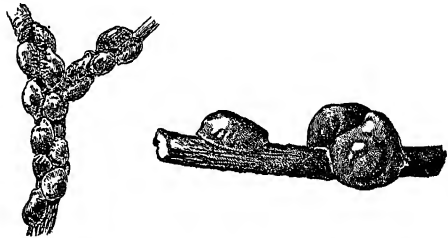
Mussel Scale Insects

These are found usually fixed into the bark of apple trees, sometimes on that of pear and currants. The "scale" is the covering, shaped like a mussel shell, which the insect has made and under which it lives

and lays its eggs. The tree is injured by loss of sap.

Apple Suckers

These are also sap-sucking pests; they attack the flower buds and the stems. The trusses of blossom turn brown and shrivelled,



Infected branch Female insects (twice natural size)

Fig. 52.—Peach Scale

and the leaves are often small and deformed. Suckers are found on apples all the summer, the eggs being hatched in March, having remained on the tree since the autumn of the previous year. The most usual method of dealing with this pest is to spray the trees with lime-wash in spring. This will coat the

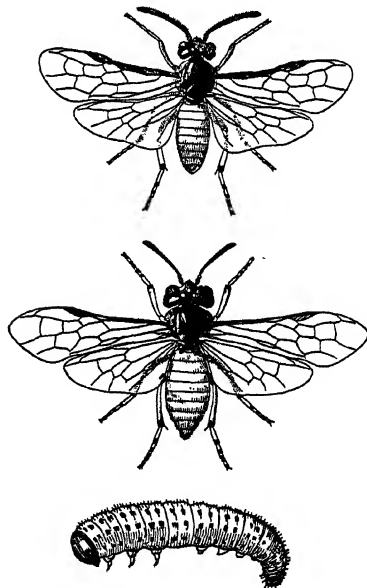


Fig. 53.—Rose Sawfly

twigs and prevent the eggs from hatching, at the same time killing any young suckers that have already hatched. Or a contact insecticide containing nicotine may be used before the blossoms open.

Bush Fruit Pests

The *gooseberry sawfly* is perhaps the best known of these pests. Its larvæ are destructive to gooseberry and red and black currants. The bushes are weakened by losing their leaves, upon which the larvæ feed. The caterpillars of the common *magpie moth*

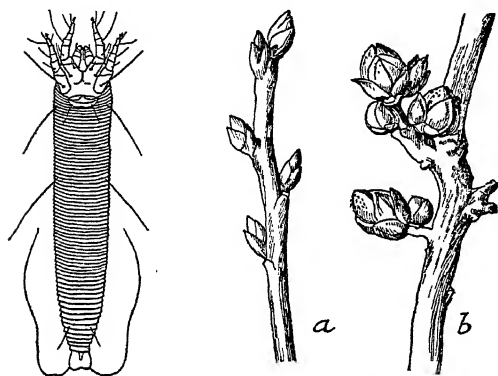


Fig. 54.—Black Gall Mite (enlarged 150 times)
a, Normal bud; b, Infested bud

are often mistaken for the gooseberry sawfly larvæ; but it will be noticed that the caterpillars walk with their bodies humped in the middle, in the true looper fashion, whereas the sawfly larvæ cling closely round the edges of the leaves as they feed. The sawflies themselves may frequently be seen resting on the stems of the bushes; they are rather like small wasps, with transparent wings and black-and-yellow bodies. Hand-pick the larvæ from their very earliest appearance, or look for and destroy the eggs, which are laid in slits along the surface of the leaves. Also spray the bushes with sprays made from lead arsenate, hellebore, pyrethrum powder, or nicotine. "Cook's" arsenate of lead paste is both safe and efficacious; it is useful for all leaf-eating larvæ.

VOL. IV.

"Big-bud"

This is an abnormal growth of buds on black currants, caused by a mite which attacks the developing buds and induces an abnormal swelling. These large, globular buds should be carefully destroyed. A safe dry spray may be made of one part of quick-lime and four parts of sulphur. This pest is very difficult to eradicate, and hand-picking, before the mites inside have a chance to migrate and propagate their species elsewhere, should be thoroughly carried out.

Pests in the Vegetable Garden

In some districts surface caterpillars are very numerous and very harmful; they are the larvæ of various moths, including the *yellow-underwing*, the *turnip* or *dart*, and the *heart-and-dart*. They are all rather large and dull coloured, with smooth skins and sluggish movements; they are very inconspicuous and are easily overlooked. Turnips, cabbages, beans, potatoes, spinach, beet, carrots, and many other plants in both the vegetable and the flower garden are attacked by them. In rather small gardens gas-lime is an excellent remedy; place it in a small ring round the plant, and renew frequently. Hand-picking is still more efficacious and

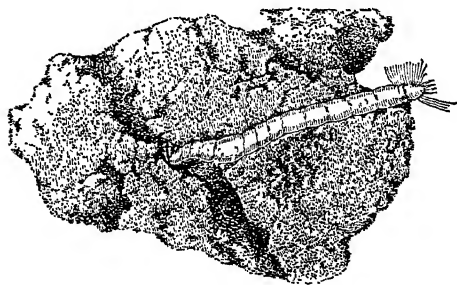


Fig. 55.—Larva of Crane-fly

should be adopted where possible, but the operation is not always easy to carry out. Pigs and starlings are our very good and capable allies in the hunting down of surface caterpillars.

Pests in the Flower Garden

For *mildews* and *leaf-rusts*, a nicotine spray is the best remedy. For slugs and snails a thorough dressing of soot is excellent. It should be remembered, however, that snails do not do so much harm as *slugs*, and they provide a nourishing food for the thrush, a bird who is exceedingly useful in devouring numbers of caterpillars, weevils, beetles, and grubs. As regards *woodlice*, *pill-insects*, and other small vegetarian pests, there is no remedy so good as cleanliness; bury all dead leaves and clear away all trimmings and clippings under which they

will make their homes. The larvæ of the *crane-fly* or *daddy longlegs*, known as leather-jackets, are pernicious and persistent pests. Rooks and starlings will eat them if you turn up the soil and expose the grubs. Many birds will also help in destroying that other well-known garden pest, the *wire-worm*; it is really more of a farm pest than a garden pest, and is often introduced into gardens in sods of grass.

If the soil is treated with quicklime to purify it from insect pests, it must be left fallow for several months—because the quicklime would destroy new-forming roots.

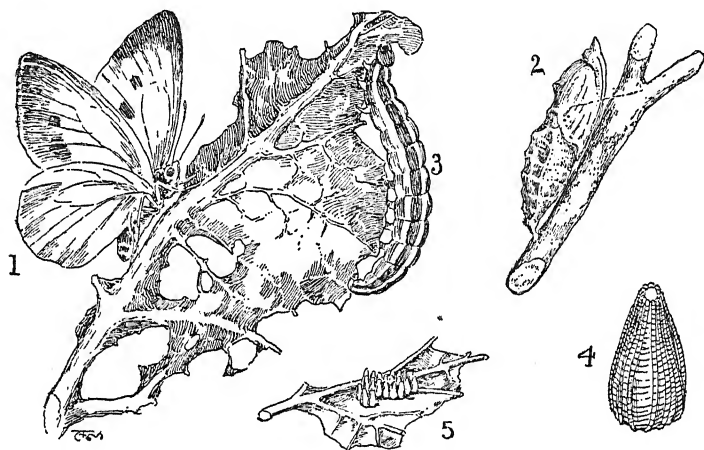
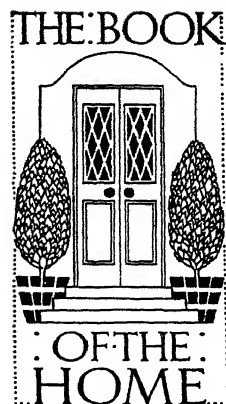


Fig. 56

1, Cabbage Butterfly. 2, Chrysalis or Pupa. 3, Caterpillar or Larva. 4, Egg (magnified). 5, Eggs on back of Leaf.

DOMESTIC ANIMALS AND POULTRY



Domestic Animals and Poultry

THE DOG

A Useful Companion

Man's best friend in the animal kingdom is the dog. He has for centuries been more closely associated with us than any other creature, and by his fidelity and usefulness he has more than repaid any trouble that has been taken on his behalf. Never, however, has so much attention been given to dogs as at the present day, many thousands of men and women breeding pedigree animals for sale or exhibition; and the influence of shows has had the result of making people desirous of possessing a companion that brings with him a decent pedigree and has pretensions to good looks. Such will cost a little more in the first instance, but the keep will be no more expensive than if it were a mongrel. This pride in the dog is to be encouraged, because it also implies that he will be properly tended and fed, instead of being compelled to fend for himself.

Choice of Breed

The choice of a dog should be undertaken with as much discrimination as that of a piece of furniture, because, all being well, he is likely to be a constant companion for possibly ten or a dozen years. Whether he is big or little, sporting or non-sporting, or merely a toy, depends entirely upon one's circumstances and tastes. A mastiff, Newfoundland, St. Bernard, or Great Dane would obviously be out of place in a small house, and it would not be kind to keep any of the bigger breeds, unless there are opportunities of giving them plenty of exercise. The first three mentioned, being of heavy make, are contented with a sedate

walk of a few miles a day, but most of the others are more active, and like the chance of a good scamper.

Terriers and the smaller breeds will exercise themselves more or less if there is a garden in which they can play, but for all that, they should go beyond the precincts of the home as often as possible. Dogs suffer from ennui, just as human beings do. Note their joy at the prospect of a walk. The bigger breeds, of course, are formidable guards, with so much strength and courage that evildoers shun the house in which they live. Any of the terriers are excellent for giving warning, and bull terriers or Airedales will tackle a burglar with the utmost gusto, or act as effectual guards on walks in lonely places. This aspect of the question should not be ignored. A sensible dog is worth more than a burglary policy.

Various Considerations.

Before making a choice, the foregoing considerations should be remembered, as well as several others. Is the dog to live indoors or out? Are price and cost of keep a matter of indifference or not? Have you time to give a little daily attention to grooming? Do you like quiet pets, or those that are incessantly active? To be really effective as a guard, a dog should sleep indoors, whatever one does with him in the day-time. This can be arranged in most houses, so long as he has acquired habits of cleanliness. Dogs with short legs and long coats pick up the dirt more readily than those with smooth coats and longer legs. Rough-coated dogs should be groomed daily with a dandy-brush, and well combed once or twice a

week, unless they are to become dirty and untidy.

A dog up to the size of an Airedale can be accommodated in almost any house without an outside kennel, a mat or rug being all that is wanted as a bed. The toy breeds, being more delicate, should have a basket or box with a cushion or straw in it, which they can regard as their very own. The small dogs, of course, present no serious obstacle to the intrusion of a man, except that they will give warning as quickly as any.

Dog Shows

Perhaps the best way of making up one's mind is to visit a show, hundreds of which are held in the country every year. Only the aristocrats of the different breeds will be on view, beside which the ordinary dog appears somewhat commonplace, but it is worth knowing that much of the beauty that is admired is the outcome of constant grooming and adequate exercise. As a matter of fact, a single dog, properly cared for, stands a better chance of doing well than one that is brought up in a kennel among a number of others, and he will almost certainly be more intelligent and interesting. A list is given below of some of the most popular breeds, with their principal characteristics, but that by no means exhausts the numbers available, seventy-four breeds and varieties being recognized by the Kennel Club.

Age to Acquire

The age at which a dog should be acquired is of some moment. Unless his antecedents are known, it is seldom wise to get one much over a year old, because it is impossible to ascertain, except from experience, what his faults are. If he has been carefully trained into habits of obedience, one will be saved a deal of trouble, but if he has acquired bad manners, he will probably be past reform. On the other hand, although a young puppy needs more looking after than an adult, and may die of distemper, he will not cost as much in the first instance, and will adapt himself to the

ways of the house as he grows up. About nine months is a satisfactory age, particularly if the puppy has got through distemper.

How to Choose

A few elementary precautions should be observed when buying. Examine the dog very thoroughly. Do not leave it until you have paid for him and taken him home. See that his eyes are bright, without any discharge at the corners. The skin should be so loose that a handful can be grasped as if it were detachable from the body. Beware of one that is tight-skinned and staring in the coat. One does not want a fat dog, but he should be in decent condition. If he has an unthrifty look, something is wrong. It may be merely worms, but it may also mean ill health.

Open the mouth to see that the teeth are not decayed, and that the gums are red and wholesome. At the same time, bear in mind that distemper often leaves a heritage of discoloured teeth. There is no need for the roof of the mouth to be black, except

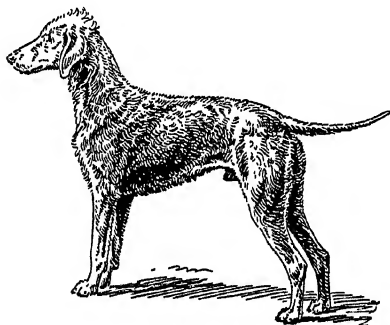


Fig. 57.—Bedlington Terrier

in chows, which also have a black tongue. It is an exploded idea to imagine that a black roof denotes purity of lineage. Go over the skin to make sure that there is no eczema. This complaint will most likely come at some time or other, but you do not want to buy it there.

Desirable Features

It is impossible to enumerate in detail the points of every breed, but there are

a few desirable features which all should share in common. The front legs should be quite straight, with a few exceptions, and the feet should not turn outwards at the pasterns. The feet need to be well rounded, and not splayed. The hind legs should be parallel with one another, neither bowed nor inclining inwards at the hocks (cow-hocked). The latter fault is more apparent in the big dogs, and is a sign of weakness or bad rearing. The chest should be capacious, either with ribs well rounded, or, if flat, as in greyhounds, very deep. This is a sign of vitality, indicating that heart and lungs have plenty of room in which to perform their proper functions. The ribs should be carried well back, so that the loins are not slack.

The demeanour should be bright and bold, without any nervousness or cringing. Hundreds are advertised weekly in *Our Dogs*, *The Dog World*, and, to a lesser extent, in *The Field* and *The Bazaar and Mart*. One other word of warning is necessary. Bull terriers are often deaf. Never buy one without testing for this defect, and do not be misled by the seller stamping on a wooden floor. The vibration will attract the dog's attention.

Care of Puppies

Puppies are ready to be weaned about the sixth week, but it is inadvisable to take one from its mother for at least another two weeks. For a time it must be kept in a reasonably warm place, and if it goes out in the wet it should be dried on returning. At that age five meals a day, beginning first thing, are not too many. They should be given at regular intervals, and all food removed when the puppy seems to have had enough. Never permit them to feed to the point of distension. The soft bone of the legs, being unable to carry the weight, will become bowed. Let the diet be varied. Cow's milk, not being as strong as that of the mother either in protein or fat, is all the better if strengthened by the addition of a little full cream milk powder. The meals may be varied, with slightly warmed

milk or gravy as the basis. In these can be soaked bread—brown in preference—boiled rice, puppy food, and, somewhat later, puppy biscuits. One or two meals may be of finely chopped meat, sheep's paunch boiled being cheap and readily digested.

Feeding Hints

Too much starchy food is undesirable, but a little boiled greens will be beneficial. The science of puppy-rearing is to keep the tiny things growing without any check, such as will be caused by unsuitable feeding. They need reasonable warmth for several months, and to deprive them of it means that

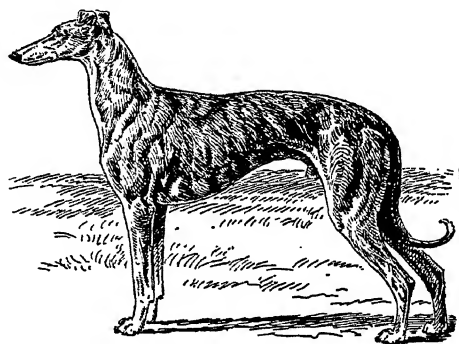


Fig. 58.—Greyhound

they must eat more to provide the necessary bodily heat. Experienced breeders usually arrange for them to be born in the spring, so that good weather is in front of them.

From the tenth week to the fifth month four meals daily will suffice, and then for about another five months the number may be reduced to three, after which two will suffice. Big bones for the youngsters to gnaw and play with are to be recommended. Between the third and fourth month the sharp milk teeth will be replaced by the permanent set, and then the food may be made thicker and less sloppy. The sooner they get on to solid food the better. Jaws and teeth are strengthened and digestion aided by the process of mastication.

Delicate Puppies

Delicate toy puppies need more care than

the hardier breeds. After weaning, a teaspoonful of scraped raw meat mixed with bread crumbs will do for one meal, and the others must be in similarly minute proportions. At two months they can eat crushed biscuits with a little boiled fish or scraped meat, which may then be increased to a dessertspoonful. One has to remember that toys and terriers are not wanted to grow big, and that the forcing diet, which is given to the bigger breeds, is undesirable for them. If a puppy does not look strong,

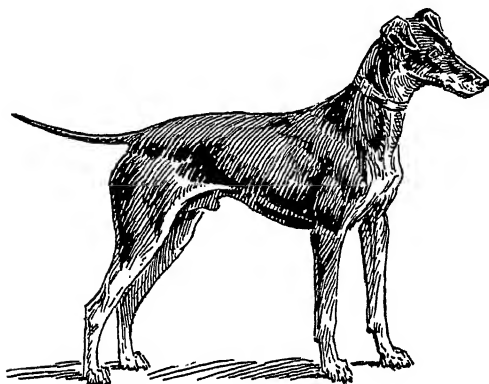


Fig. 59.—Black and Tan Terrier

or the bones of the front legs are inclined to bend, a little cod-liver oil once a day is an excellent thing, always bearing in mind that it has laxative tendencies. It contains valuable vitamins which are helpful in the prevention of rickets.

Keep them Healthy

Puppies suffer a good deal from round worms, the presence of which can usually be detected by abdominal distension after meals, staring coats, and a general look of unthriftiness. Sometimes a little powdered charcoal sprinkled on the food once a day works beneficially, and medicinal paraffin is recommended by some. Mix five grains of salol to the ounce of paraffin, and give from one to four teaspoonfuls, according to the size of the breed. If this is not efficacious, nothing can be done but resort to worm mixtures for puppies, which are made up by reputable firms. There is considerable danger in dosing young puppies,

and it should only be done when the case seems to be serious.

After feeding, if any food gets on the puppy, wipe it off. Lice are otherwise encouraged. These objectionable insects can be found at the back of the neck or round the ears. They can be exterminated by sponging with an emulsion of two parts paraffin to one of skimmed milk. Warm the milk, put in the paraffin, and shake well. If the puppies are brushed with a soft brush and kept clean, there is not much danger of external parasites. Diarrhoea is weakening, and, if it persists, may be serious. Seek the cause. It may be worms, unsuitable food, chills, or dirty feeding vessels. Give a little olive-oil first, and then feed on arrowroot. If it then continues, mix the raw white of egg, slightly beaten, with the arrowroot. As a last resort, shake dry on the tongue from two to four grains of carbonate of bismuth every four or five hours.

Popular Breeds

Although the following alphabetical list of popular breeds does not profess to be exhaustive, it contains all that are most suitable as companions; some are too scarce to be found readily, and are therefore omitted, together with those that are altogether beyond the reach of any but the wealthy. Most of the sporting kinds are best left to their highly specialized duties.

Airedale Terrier.—Smart, active black-and-tan terrier. Sometimes grizzle-and-tan. Wire-haired. Weight from 40 to 45 lb. Hardy. Price reasonable. *Disposition:* Excellent guard, most intelligent and teachable.

Alsation Wolf Dog.—Very popular. The sheepdog of certain districts of Germany. Smooth-coated of various colours, the favourite being wolf-grey. A little taller than a collie. Singular for the upright carriage of the large ears, which gives the dog a wild appearance. Price expensive. *Disposition:* Wonderfully sagacious. Can be trained to do almost anything. Chief war and police dog of the Continent. Suspicious of strangers.

Bedlington.—A little bigger than a fox terrier. Snaky-headed, arched in loin.

Thickish coat. Blue, blue-and-tan, liver, liver-and-tan, &c. Fairly cheap. *Disposition*: Sensible and companionable. Very sporting.

Bulldog.—Rugged, stolid, and slow. Big wrinkled head. Wide skull. Under jaw has an upward sweep. Very short nose. Broad chest. Body tapering to the loins. Stout legs. Price medium to dear. *Disposition*: Faithful and courageous.

French Bulldog.—Smaller and more active than the British. Weight 20 to 28 lb. Upright ears, and not so wide in chest.

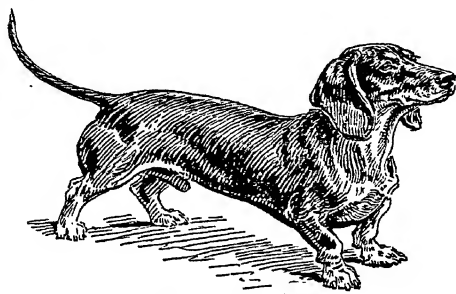


Fig. 60.—Dachshund

Price expensive. *Disposition*: Friendly and lively. Suitable for house.

Bull Terrier.—Muscular, powerful white dog; occasionally brindle. Various sizes from 30 to 50 lb. Short smooth coat. Whip tail. Small, deep-set eye. Price moderate. *Disposition*: Fearless. A formidable guard. Headstrong unless well trained.

Cairn.—Smallest sporting terrier, of 14 lb. or less. Short legs, wiry coat. Foxy head. Tiny, erect ears. Various colours. Price moderate. *Disposition*: Game and sporting. Somewhat excitable.

Chow-Chow.—Charming dog of medium size. Rough coat, red, black, blue, &c. Tiny, rounded ears. Tail curled over back. Scowling expression. Black tongue. Price medium to dear. *Disposition*: Great attachment to owner. Ignores strangers. Wonderful bump of locality. Strong individuality.

Collie Dog.—A general favourite. Showy long coat in the roughs. Sable, sable-and-white, black-tan-and-white. Long, tapering head. Graceful outline. Ears small and

semi-erect. Price reasonable. *Disposition*: Sagacious.

Dachshund.—Short, crooked legs. Long body slightly arched at loin. Ears carried close to cheek. Fine, glossy coat. Chief colours, red, chocolate, black-and-tan. Price moderate. *Disposition*: Amusing and companionable.

Dandie Dinmont.—Short legs, long body. Best weight, 18 to 24 lb. Coat roughish and pily. Soft topknot on head. Colour, mustard or pepper. Price medium. *Disposition*: Faithful and kindly, but a demon to fight when roused.

Fox Terrier.—Ubiquitous in the British Isles for sport or as companion. Stands like a good hunter. Straight legs, long head, punishing jaw. Small, cat-like feet. Hard coat. Wires and smooth identical except for coat. White, with slight black or tan markings. Price cheap. *Disposition*: Friendly and accommodating. At home anywhere. Smart guard.

Irish Terrier.—Red, yellow-red, or wheaten. Wire-haired. Taller and a few pounds heavier than the fox terrier. Price reasonable. *Disposition*: Indicated by his nickname of "daredevil". Kindly at home, but ready for a scrap with other dogs.

Mastiff.—One of the biggest dogs in the world. Heavy and slow. Smooth-coated. In colour, fawn or brindle. One of the most ancient of British breeds. Price high, and expensive to keep, needing a lot of meat. *Disposition*: Forms great attachment to owners. Ideal guard.

Newfoundland.—Entirely black or black-and-white (Landseer). Long thick coat. Heavily built. Big bone; capacious chest and ribs. Price high. *Disposition*: Splendid companion and guard.

Old English Sheepdog.—A rough-coated, active animal of medium size. Hardy and likeable, but needs a good deal of grooming. Price moderate. *Disposition*: Friendly and wise. A most sensible creature.

Pekingese.—The most popular toy. Short, sturdy, bowed legs. Long body, which is lion-shaped, being heavier in front than behind. Wide, flat skull. Short face.

Long and showy coat. Price usually high. *Disposition*: Bôld and friendly.

Pomeranian.—Second to the Pekingese in favour. Dainty and graceful, with long coat in beautiful colours. Coat should be brushed wrong way. Sharp, foxy head. Price medium. *Disposition*: Excitable.

Pug.—A pleasing pet. Black or fawn. Tail tightly curled. Round head and short face. Fine coat devoid of doggy smell. Price moderate. *Disposition*: Very affectionate.

St. Bernard.—A big imposing animal. Massive head. Benevolent expression. Red, orange, or brindle, with white patches distributed according to an approved pattern. Rough or smooth. *Disposition*: Dignified, kindly, devoted guard.

Schipperke.—Sharp-headed, active little black dog. Apparently tailless, through being closely docked. Pointed, erect ears. Coat short but dense and harsh. Price cheap. *Disposition*: Friendly. Alert guard.

Sealyham.—Short-legged, white-haired terrier. All white, or with lemon, brown, or badger-pied markings. Stronger in head than fox terrier. Price, all sorts. *Disposition*: Dead game.

Spaniel, Cocker.—Smallest sporting spaniel. Active. Longish body. Short legs. Black, black-and-white, or roan. Price moderate. *Disposition*: The friend of all. Good manners.

Spaniels, Toy.—Once the principal toys. Long, silky coat. Big head, short face, long ears. Black with bright mahogany tan markings (King Charles). White with black patches and tan markings (Tricolour). Rich chestnut red (Ruby). Pearly white with chestnut red patches (Blenheim). *Disposition*: Affectionate.

Scottish Terrier.—Short-legged, wire-coated. Small prick ear. Steel or iron grey, black, brown, or grey-brindle, black, sandy, or wheaten. Price reasonable. *Disposition*: Faithful and plucky.

Welsh Terrier.—More homely looking than the fox terrier. Black-and-tan wire coat. Price cheap. *Disposition*: Much like other terriers.

West Highland White Terrier.—Much the same style as a cairn, but a little bigger.

All white. Price moderate. *Disposition*: Terrier-like and friendly.

Whippet.—A miniature greyhound of about 20 lb. weight. Various colours. Fine coat. Dainty and graceful. Price reasonable. *Disposition*: Smart and all alive. Good house dog.

Yorkshire Terrier.—Another toy, with long dark steel-blue coat. If not too small, an excellent house dog. Price moderate. *Disposition*: Quick and intelligent.

Kennels and Bedding

If the dog is to live out of doors, a kennel is a necessity, unless there is a shed that is not draughty. The chief desiderata about

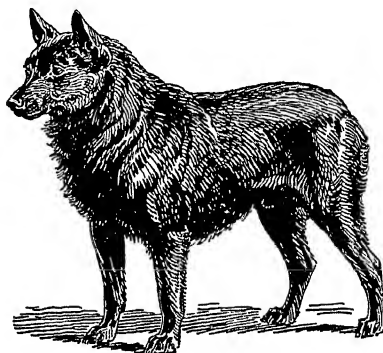


Fig. 61.—Schipperke

a kennel are that it should be sufficiently roomy and warm. Err on the right side in the former respect rather than otherwise. One with an entrance at the end is undesirable, because it admits of the wind blowing straight on to the occupant. Let the aperture be on one side, near the end, and the portion farthest from the entrance should be partitioned off by a deep board, which keeps the bedding tidy and promotes warmth. A wooden platform outside serves for the dog to lie on in the day time, and is preferable to the damp earth. If one side of the kennel is hinged, it can be raised so as to protect from sun or rain.

Never chain a dog. It is cruel to restrict the movements of an active animal in this manner. Give a thick bedding of straw, which should be renewed frequently. If

this is put over a deep layer of sawdust it will be more comfortable. Easy access to the interior is desirable for cleaning purposes. A dirty kennel makes a dirty and unhealthy dog, infested with fleas.

Feeding

The dog being a carnivorous animal, a certain amount of meat is desirable if he is to remain fit. In many households the scraps from the kitchen are sufficient in themselves, and nothing can be better than the odds and ends which find their way into a bowl. A few scraps of raw meat from the butcher are much appreciated occasionally, and good sound biscuits are always a useful standby. It is not necessary either to soak or break these, except for the toys. Sloppy foods for adults are not to be encouraged. Let the dog do some work with his jaws. It is entirely optional whether one or two meals a day are allowed, the custom of the big breeders varying. One is certainly enough. Whichever you do, observe punctuality. A dog knows to a few minutes when dinner time has come, and if you are behind-hand he becomes restless and importunate.

The principal meal should be given at night, and the dog will be less likely to disturb the household by barking if he has had a good feed about eight o'clock. Avoid monotony. Should he tire of biscuits, give stale brown bread with a little milk or gravy on it. Cod's head, boiled until the bones are softened, makes a change, and sheep's paunch is liked. Do not give liver; it is regarded as a delicacy, but it is a laxative and may be permitted now and then for this purpose. Well boiled oatmeal in the winter is another variant, or oatmeal biscuits may be had.

Dog's Training

An unruly animal is a nuisance in the house or out. Nearly every dog is amenable to discipline, and, *per contra*, all are capable of being spoilt just as children are. The fault is entirely that of the owner. If you are weak-willed, be sure that your pet will take advantage of it. Always be firm, but not brutal. You can compel a dog to obey

you without thrashing him. Quite a young puppy can be subjected to wholesome discipline, and the earlier you start the more likely is he to acquire decent manners. Limit your vocabulary, and make him respect you. Noisy bluster will only frighten him. Let the early lessons be simple and restricted in number. Pat him when he does right, and he will know from your demeanour without much rating when he has done wrong.

Teaching Obedience

Implicit obedience in coming to heel is the chief thing to inculcate, and the dog should keep to heel until told to go on, unless you want him killed by a motor. He can be taught to lie down, and stay there; to guard any object, and so on. Indoors, never permit him to worry at meal times. If he is fed then he is bound to bother you, and when you chide him he will not understand how he has sinned. He should never have scraps from the table. Do not let him lie before the fire. Allot him his own particular corner in the room, and insist upon him going there every time, so that he will be out of the way when he is not wanted.

Meaningless barking should be checked.

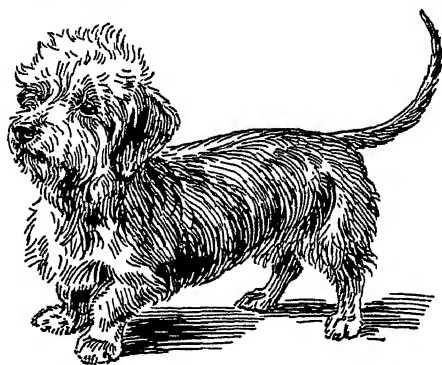


Fig. 62.—Dandie Dinmont

There is no reason why a well-cared-for dog should always be making a noise. The neighbours will not like it, even if you do not mind yourself, and he is little use in giving warning if he is always babbling. Various tricks are easily acquired, such as

fetching one's slippers, the letters, &c. Remember that a well-educated dog is a pleasure to his owner, and is much happier himself, and he soon becomes proud of his accomplishments.

Exercise

Robust health without exercise is an impossible condition, both in respect to man and animals, and in no domestic animal is this the case more than in the dog. The life of indolence and ease permitted to many of our canine pets, combined as it generally is with luxurious living, is the direct cause of the most abiding and fatal ailments.

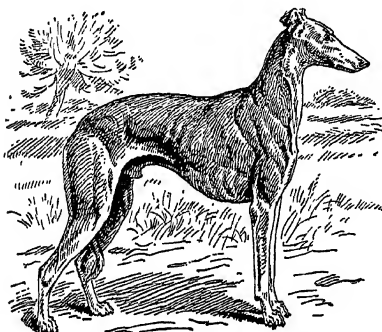


Fig. 63.—Whippet

The effect of muscular exercise is to increase the activity of the circulation, and by so doing to cause an abundant supply and frequent renewal of blood to the organs and tissues of the body. At the same time respiration is quickened, oxygen imbues the system, and by it the waste products of nutrition are burnt up into a condition in which they are capable of being removed, instead of accumulating in the body to impair and poison it.

It is impossible to lay down any fixed rule as to the amount of exercise to be enforced. This will depend upon considerations as to age, the presence or absence of physical infirmity, constitution, &c.; but it may be said that adult animals in good bodily health should be compelled to take at least two hours' exercise daily—an hour in the morning and another in the afternoon.

Leading dogs on chains is not the kind of activity here contemplated. They should be allowed their freedom to gallop and romp at their will, and be induced to do so by chasing a ball or stick, hunting a hedgerow, or by some other means of encouragement.

The Dog in Sickness

Within the space of this article it is not possible to deal with all the diseases from which dogs may suffer, but the commonest are indicated, and a few simple remedies given. As a matter of fact, a normal animal, properly fed, exercised, groomed, and housed, should not cause much anxiety.

Asthma.—Characterized by shortness of breath and frequent coughing. Often present in aged dogs that are allowed to get too fat. Give Epsom salts as an aperient. Dose: 1 to 4 dr., according to breed. If put in a room with a bronchitis kettle the breathing will be relieved.

Catarrh.—Similar to the human cold in head. Keep in a warm room for a few days, and give a mild expectorant, such as syrup of Tolu, or syrup of squills, from 10 to 60 drops of either.

Diarrhœa.—Begin with castor-oil, $\frac{1}{2}$ to 2 oz. Three times daily give from 5 to 20 gr. carbonate of bismuth in the dry form. If persistent, put on to diet of arrowroot.

Distemper.—The deadliest disease to which dogs are liable, is contagious, and it does not therefore follow that every puppy must contract it, but most of them do. Signs of lassitude, feverishness, a hot, dry nose, disinclination for food, followed in a few days by discharge from nose and eyes, make diagnosis easy. Put in a warm, well-ventilated room, and clothe with a flannel jacket, which should protect the chest. Treat as you would a human being with a high temperature, and feed on nourishing slops. In its simple form this should suffice, but complications almost invariably supervene, the chief being pneumonia, fits, or dysentery. Each wants treating in the appropriate manner, and it is best to seek skilled advice, always understanding that nursing is the chief thing.

Nose and eyes should be sponged three or four times a day, with permanganate of potash, and the gums should be washed in like manner. If running sores appear on the body, especially on the abdomen and inside of thighs, they are regarded rather favourably unless they become too bad. Dust them with dry boracic powder. Fits are not usually noticed by the inexperienced until they get beyond control. At first there is merely a convulsive champing of the jaws for a few seconds, and if this is observed, give from 3 to 15 gr. bromide of strontia, every three hours, in from a teaspoonful to a tablespoonful of water. Do not give solid diet or exercise for at least a week after the patient seems to have fully recovered. Too much caution cannot be exercised in this matter.

Ear, Canker of.—The dog shakes his head, and either scratches or rubs the affected ear. Internal inflammation is apparent on examination, and unless checked, a nasty discharge ensues. In the early stage boracic powder dropped well into the orifice daily is sufficient. If the discharge is severe, syringe with a tablespoonful of methylated spirit in a little water slightly warmed, and then apply boracic again.

Eczema.—A troublesome skin complaint, often caused by worms or starchy foods. If the sores are moist and not very extensive, dust with powdered sulphur. A bath containing a little Jeyes' fluid will often cure. In bad cases try the following, which should be mixed out of doors, as the smell is offensive. Take two separate pints of soft water. In one mix 2 oz. sulphuret of potassium, and in the other 2 oz. fluid hydrochloric acid. Pour the two together, and then dab the parts with a sponge.

Feet, Sore.—The pads sometimes become sore, especially with sporting dogs. Paint two or three times a day with compound tincture of benzoin. If an open wound, bandage after applying the tincture. Boils between the toes should be poulticed until soft, and then opened. Insert boracic gauze for a day or two, and bandage. This permits the place to drain. Acute inflamma-

tion at the root of a claw is very painful. Paint with tincture of iodine. Dogs not exercised on hard ground sometimes get ingrowing toe-nails. These should be clipped off.

Fits, Epileptic.—These are often mistaken for rabies. The sufferer falls in convulsions, froths at the mouth, and appears in great distress. On recovering he is dazed, and may run heedlessly away unless stopped. 3 to 30 gr. bromide of potassium in a little water three times a day, and continued for several weeks.

Jaundice.—Jaundice may arise from a chill on the liver. Consequently it is most likely to occur in dogs that go into the

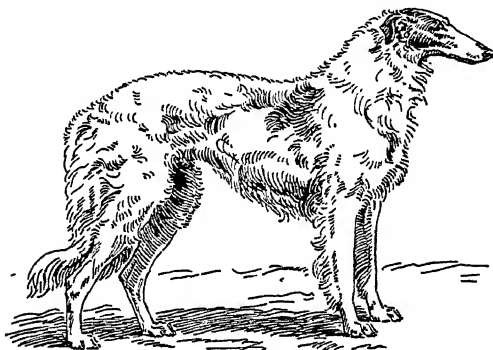


Fig. 64.—Borzoi

water when heated from exercise. Or it may arise from the bile duct being obstructed, so that the bile, instead of reaching the intestines, is diverted into the blood. Hence the characteristic yellow appearance of the sufferer. There is loss of appetite, vomiting, excessive thirst, &c. Careful attention must be paid to the diet, which may consist of a little lean meat, gruel, or milk. Epsom salts to overcome the usual constipation. Massage of the abdomen may free the obstruction. Potassium acetate, 5 to 15 gr., as a diuretic.

Mange.—This disorder is highly contagious, but not often occurring in well-kept dogs, unless they are permitted to come into contact with one that is affected. The sarcoptic, or red mange, is caused by the presence of a parasite on the skin. It usually

spreads rapidly, and there is intense irritation. Wash thoroughly with soft soap, and then dress with a mixture of powdered sulphur and vegetable oil several times, covering the animal thoroughly, and disinfecting his sleeping quarters. Bath again when the cure is complete. Follicular mange is much more serious, but far less contagious, because the mite burrows into

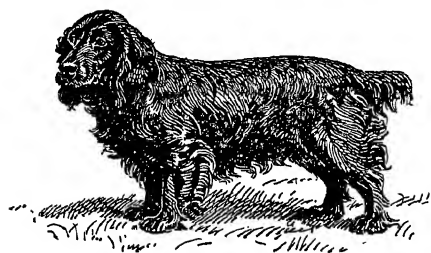


Fig. 65.—Black Cocker Spaniel

the hair follicles and sebaceous glands. At the onset only small bare patches appear, probably on the face and nose. These extend slowly until all the body is attacked. The hair falls off, and the skin becomes wrinkled, of a slaty colour. A veterinary surgeon may be consulted, although a cure is problematical. It should be noted that there is not much itching, but the dog will shake himself. The sulphuret of potassium remedy recommended for eczema may be tried.

Rheumatism.—This is a constitutional disease, usually affecting the limbs and loins. In the dog it mostly assumes a chronic character. Old animals, and especially sporting dogs, exposed to wet and cold, are particularly liable to it. When the limbs are the seat of attack, the dog is indisposed to move. If induced to do so, he walks with a stiff or halting gait. The part affected is hot and painful to the touch, and may be more or less swollen. In lumbar rheumatism the animal's back is arched, the belly tucked up, and the body carried stiffly. If the loins are pressed, or an attempt be made to lift him up, he shrieks with pain. The pain and lameness vary considerably from day to day, being at one time slight and at another severe; or they may alto-

gether disappear and reappear at varying intervals in the same or in another part of the body.

Prevention and Treatment.—Rheumatism is hereditary, the exciting causes being exposure to wet and cold after being heated and fatigued, and living in damp kennels. In house pets it is often provoked by exposure to cold and wet after occupying the hearth of a heated room, and excessive indulgence in sugar and sweet biscuits.

The treatment of rheumatism should be commenced by the administration of a dose of castor oil or sulphate of magnesia, to be followed by small repeated doses of from 2 to 15 gr. salicylate of soda. The food should consist chiefly of brown bread and well-boiled milk, with vegetables and a little soup or gravy. The affected part may be briskly rubbed with soap liniment once or twice a day, and the patient should be kept warm.

Worms.—Most dogs are infested with these parasites at some time or other, and when they are present it is impossible for the host to thrive. If the coat is staring and the condition poor it is almost certain that physic is necessary. Adult dogs usually suffer from the tapeworm, small segments

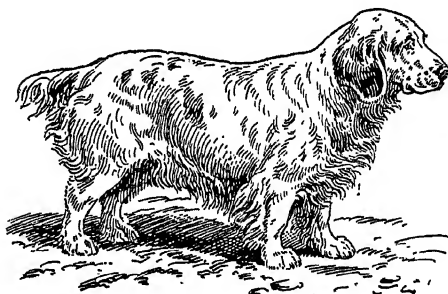


Fig. 66.—Clumber Spaniel

of which, about $\frac{3}{4}$ in. long occasionally come away in the droppings. If they are seen, of course, there is no question as to what is the matter. The head of the parasite must be got away if any relief is to be experienced, and, in order that the medicine may act properly, it should be given on an empty stomach, which means that the dog should be fasted for twenty-four hours.

Some prefer to precede physicking with doses of olive-oil, and the medicinal paraffin is also thought well of by modern breeders. Ready-made worm balls are put up by reputable firms, but, if home treatment is preferred, nothing is better than powdered areca nut in the proportion of 1 gr. for every pound the dog weighs, the outside dose for a big dog, however, being 120 gr., say for a mastiff or St. Bernard. Unless the nut is freshly ground it is not much use, and the powdering of it on a nutmeg grater in any quantity is a lot of trouble. It will often be swallowed readily if mixed with dripping and smeared inside the mouth. In an hour or two give castor oil.

General Advice

Be patient with a sick dog. Women make the best nurses, being prepared to take any amount of trouble. In distemper, forcible feeding, or drenching, as it is called, is frequently necessary. Put the gruel or broth in a wide-mouthed bottle. Insert the bottle between the lips with the right hand, and with the left make a pouch of the lips on the other side, so that the liquid cannot be spilled. Liquid medicines may be given in the same way. Capsules may be bought for enclosing small doses of

physic, and powders can often be given in a ball of stiff dough. In administering a ball or capsule, push well down the throat. If the dog's lip is drawn over the upper teeth and held there by the left hand, he cannot bite.

Useful Information

The dog tax is 7s. 6d., renewable on 1st January, and must be taken out for every animal over six months, the only exemptions being for those used exclusively for shepherding or cattle droving, or leading the blind. A licence is only available during the year in which it is issued. One taken out on 31st December would be renewable the next day.

The Kennel Club, 84 Piccadilly, is the governing body of the dog world. Any dog must be registered there (fee 3s. 6d.) before it can be exhibited. Next in importance is the Ladies' Kennel Association, Belfast Chambers, Regent Street. Every breed has a club founded to promote its interests, and there are innumerable canine societies throughout the Kingdom. The Scottish Kennel Club in Edinburgh co-operates with the English Kennel Club. The Irish Kennel Club in Dublin has now set up as an independent body.

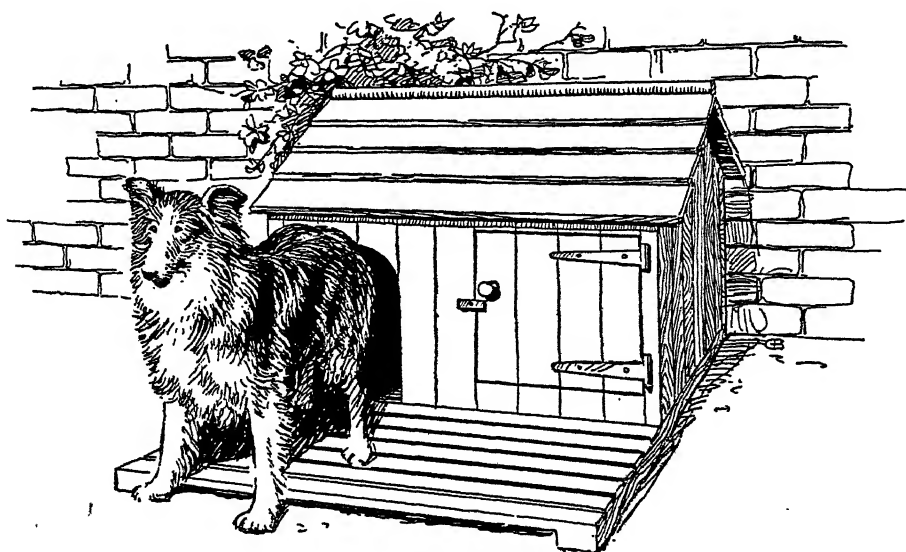


Fig. 67.—Portable Kennel with Platform

THE CAT

Different Varieties

Experts divide cats into long-haired and short-haired, the former being the Persians, and the latter including the English, the Manx, the Siamese, &c. The Angoras, of which old-fashioned people sometimes speak, are merely a variety of Persian. Since attention has been given to scientific breeding, many beautiful colours have been evolved from the long-hairs, perhaps the most exquisite being the chinchillas or self-silvers. There are also the ordinary self colours, of which the blue is very popular, and also different tabbies and tortoiseshells. White cats are frequently deaf, and, owing to the readiness with which they soil, are altogether unsuitable for town life.

In deciding upon the kind to be kept, it should be remembered that those with short hair are far less trouble, they are hardier, and they remain in good condition most of the year; whereas the long-haired cats do a good deal of moulting, and their coats require frequent brushing if they are not to become unsightly.

Good Points

Except for their coats, the points are practically identical. A broad head, short nose, large eyes, small ears, short thick legs, and a cobby body are desirable. The tail of the long-haired cat is usually shorter than that of the other. The colours too are very much the same, with a few exceptions, the range in the short-hairs being more restricted. There are no chinchillas among them, smokes are seldom seen, there are few creams, and there is a considerable difference between the long-haired orange and the short-haired red.

Considering first the long-haired, it may be noted that, after the structural points alluded to, profusion of coat is of the utmost importance. There should be a full frill round the neck, covering shoulders and chest. The body should be thickly clad, including the sides, and the tail bushy.

The colour of the eyes is governed by that of the coat.

Individual Peculiarities

In the *Chinchilla*, the white hair shades to a faint grey at the tips. There should be no darker shading along the back, or markings on the face or legs, but the desired purity is most difficult to get, and a cat possessing it is very valuable. If there are stripes they become silver tabbies. The eyes should be emerald, but many are orange-coloured. The kittens, which are usually born black, are delicate.

Blue eyes are much-desired features of the *Whites*, but, curiously enough, the eyes of this variety are often odd. The *Blues* are really a bluish-grey. They come sound in colour, and the lighter they are the better. Eyes should be deep amber or orange; green or greenish-yellow are incorrect. *Blacks* should be of a lustrous colour free from rustiness, with eyes of deep orange or copper. *Smokes* are fascinating, but they do not retain their bloom for long in the year. The under fur should be nearly white, with black on the top, shading to smoke or grey; ear tufts and ruff light, and eyes orange. In *Tortoiseshells* the black, orange, and yellow should be well broken, clearly defined, and without tabby markings, with eyes of bright orange or hazel. *Self Orange* cats have eyes of orange or hazel. In *Tabbies* the characteristic pattern may be striped or spotted. The brown tabbies may have eyes either orange or green.

Short-Haired Breeds

One or two breeds among the short-haired need special mention. Although associated with the Isle of Man, the *Manx* cat probably is of Asiatic extraction. It may be of any colour. Apart from being distinctive on account of its absence of tail, it has other peculiarities. It is shorter in the back, and the long hind legs give it the action of a rabbit. It seems to be less

feline in nature than others of the cat kind, making an amusing pet.

The *Siamese* is too rare ever to be cheap. It is a fascinating animal, with something of the temperament of the Manx. The body colour is of a lightish cream, the mask, ears, legs, and tail being a seal-brown—a contrast which is very pleasing, while the eyes are a bright blue. The head differs from others in being long and pointed, and the body is also rather long, with slight legs. The tail frequently has a kink. Anyone breeding Siamese should understand that as kittens they are white, the true colour coming gradually, but not remaining long in perfection, the tendency being for it to darken with age.

The colour of the *Abyssinian* closely resembles that of the wild rabbit, and should appeal to anyone in search of a novelty. The coat is close.

Proper Treatment

Kittens settle down into a new home without any trouble, and so do many adults, but others, of a nervous disposition, need careful handling. Coax them quietly and offer food, and give them no opportunity of escaping until they have made themselves at home. If they do get outside, the worst thing one can do is to chase them. They can only be caught by persuasion. Merely as a pet, a neuter will give most satisfaction, being placid and easy-going. On no account have a tom. Unless a cat has its full liberty, a sanitary pan containing dried earth should be provided.

Do not allow your pet to stay out at night. It will make all sorts of undesirable acquaintances, and possibly contract disease of some sort or other. If the principal meal is given in the evening, pussy will form the habit of coming in at the proper time.

Food and Toilet

The more fresh air and liberty it has, the better for its health. More care has to be taken of the delicate long-haired varieties, but any ordinary cat will stand much wet and cold. Even if they are out of doors in bad weather, they have the sense to seek a comfortable spot. Two meals a day, with

a little milk in between, is all that is wanted in the way of feeding. The feline tribe being carnivorous, a certain amount of meat is necessary, and fish is always appreciated. Do not chop the meat up fine. The mastication necessitated in tearing up lumps of meat is beneficial.

Cats confined to a cattery require the coarse couch grass to nibble at, or even canary seed germinated in a pot. Long-haired cats should be groomed, particularly when moulting, so that they do not swallow a quantity of hair in performing their toilet. Sometimes so much collects in the stomach that an emetic has to be given.

Feline Ailments

Dosing a cat is not a simple process, and it is wise to protect yourself by enveloping the four feet in a cloth so that it cannot scratch. The gullet of a cat being small, do not attempt to give more than a teaspoonful of liquid at a time.

Canker of the Ear.—This disease is characterized by an inflamed appearance, and afterwards a discharge. Nothing is better than boracic powder, dropped well into the orifice once a day.

Catarrh.—Catarrh or cold is of frequent occurrence. The cat is fond of heat, and will lie for hours in front of the fire. Open windows and draughts are the most common causes of catarrh. The symptoms are sneezing and discharge from eyes and nose, commonly accompanied by sore throat and difficulty in swallowing.

Treatment.—Keep in the house in some place in which the temperature is uniform, steam the head if the discharge is profuse, and if the throat is affected apply stimulating liniments and wrap it in flannel or lint. Colds, if neglected, may result in pneumonia, pleurisy, tuberculosis, &c., as in the human subject.

Diphtheria.—A sore throat, difficulty in swallowing, and general signs of illness indicate diphtheria. As it is communicable to human beings, great care should be exercised immediately there are suspicious signs, and the patient should be put in charge of a vet. It is not common.

Distemper.—This is a highly contagious disease, and may attack cats of any age or breed, but those well looked after are not so likely to get it as exhibition animals. The rate of mortality is high. The early symptoms are lassitude and dullness, disinclination for food, high temperature, and sickness; the later signs are catarrh of the head, resulting in the typical sneezing and discharge of purulent mucus from the nose and eyes, great prostration, and often diarrhoea of an obstinate nature. The disease generally runs its course in about three weeks, and death may occur from weakness or other complications, such as pneumonia or inflammation of the bowels. There are two forms of distemper, the virulent and the mild. The disease is often contracted at shows and other public places.

Treatment.—Sustain with nourishing foods: beef-tea, raw or boiled fish, bovril, brandy and milk, &c. Steam the cat's head three times a day with a sponge and hot water, and add a few drops of oil of eucalyptus. Careful nursing is all-essential, and tonic medicines, such as quinine, iron, cod-liver oil, &c., are beneficial. Any complications should be attended to at once.

Eczema.—This is a constitutional disease, and often occurs as a result of too much stimulating food and want of exercise. The symptoms are: irritation of skin in parts of the body and consequent scratching; small pimples appear, which run together and form areas about the size of a shilling; liquid oozes from these, and the hair drops off, exposing the raw, irritated, and inflamed surface.

Treatment.—Clip the hair from the surrounding part, apply soothing ointment, feed on milk diet, and give preparations of arsenic and iron, and laxatives. This disease tends to recur, and is often of an obstinate or incurable nature, especially in old cats. It is not infectious.

Influenza.—Influenza is very similar to distemper, but is not so virulent. The treatment is on the same principles. Frequently it requires the skilled veterinarian to differentiate between the two diseases. It has been suggested that influenza can

be communicated from cat to man, and vice versa, but so far investigations do not support this theory. It has, however, been experimentally demonstrated that distemper in the dog and the cat is analogous, and can be communicated from the one to the other.

Tuberculosis or Consumption.—This disease is more common than is popularly supposed. Persian cats appear more susceptible than other varieties. Symptoms depend on whether the lungs or the bowels are the seat of the disease. If the lungs are affected, the presence and nature of the disease are generally shown by catarrh, sneezing, and discharge from nose and eyes, difficulty in breathing, fever, progressive emaciation, and death from weakness; if in the bowels, obstinate diarrhoea and wasting. Consumption may be communicated from the human subject to the cat and dog, or vice versa, and this fact is important when we recollect how fond children are of caressing cats.

Treatment.—Little can be done, and it is often very difficult to distinguish between simple catarrh or cold and tuberculosis in the early stages of the disease.

Worms.—A healthy, well-reared puss is not likely to suffer from worms, but, if these parasites are present, they must be got rid of. A ravenous appetite in conjunction with a low condition and a spikiness of hair are almost sure symptoms. Five drops of oil of male fern in a tiny capsule will be efficacious, but powders are also sold. Do not try to dose a young kitten.

Other Diseases

Numerous other diseases attack the cat, such as inflammation of the bowels, lungs, or other organs, and skin affections, such as mange and ringworm. Cats often meet with accidents resulting in fractured limbs, and it is interesting to know that if attended to immediately (provided the bone is not severely shattered) and the leg set in plaster of Paris, the results are highly satisfactory as a rule; lameness gradually passes off, and the animal regains the perfect use of the limb.

CAGE BIRDS

One of our greatest statesmen said that the presence of a canary in the window of a house was evidence of refinement of character and kindness of heart in the occupants. No pets are more generally kept in Great Britain, canaries being easily the first in favour. This fact is to be welcomed, because native birds caught in adult age do not take readily to confinement, and the rate of mortality is deplorably high. What are known as soft-billed, i.e. insectivorous birds, such as blackbirds, thrushes, starlings, and skylarks, require more careful treatment than the seed-eaters, and are consequently more trouble to feed.

Canary Breeding

Canary breeding is a pleasant and profitable hobby, that deserves every encouragement. Working-men who follow it are practically always desirable members of society. The demand is almost unlimited, and since the war especially, prices have been remunerative.

The Yorkshire.—In appearance this bird is the aristocrat of the canary family, and, next to the Norwich, is the most popular. His carriage is almost upright, the back and neck from the skull downwards being in nearly a straight line, and the feathers should be as tight as wax. The shoulders are narrow, and so is the breast, which is also rounded. The feathers on the slender waist should fit closely, and there should be no frill on the breast. The legs are straight and long. The total length of a medium-sized bird would be about $6\frac{3}{4}$ in. Although Yorkshire is still the home of the "fancy", the bird is common all over the country.

The Norwich.—This bird is a general favourite, named after the cathedral city in which it has been bred since Flemish refugees settled there in the sixteenth century to escape the persecutions of the Spaniards. The bird is stout and cobby, suggesting a bullfinch in character. The head is broad, the neck short and full, and

the feathering should be close and fine. Great attention has been paid to colour, the yellow being deep and rich. Canaries are divided into yellows and buffs, and we have also self-coloured greens, ticked, and variegated. All are to be found in the Norwich.

The Crested.—This bird is the most costly of the canary family, as much as £100 having been paid for exceptional show specimens, and from £10 to £40 is not uncommon. Owing to the difficulty of breeding perfect individuals, they are naturally worth a lot of money. In their chubbiness they somewhat suggest the Norwich, but the distinctive feature is the crest which crowns the head. Great importance is attached to the size and shape. It may cover the beak and conceal the eyes. Preferably the centre should be just behind the line of the eyes, and the whole should be circular in form without any break. A dark crest on a clear-bodied bird is highly prized, and is certainly very striking. In breeding, a crested is paired with a crested—*that is, a bird without a crest, the produce of a crest and a plainhead.*

The Roller.—Those who find an ordinary canary too noisy for a living-room are charmed with the subdued song of the roller, which is of German extraction. Great pains are taken to perfect this song by artificial means. When the young birds are old enough to leave their parents, they are placed in a room in the company of one or two perfect songsters that are known as schoolmasters. In time the young come to copy the various tours, which make up the equipment of the adults. Supplementary to the teaching of the schoolmasters, the owner also from time to time plays a bird flute or mechanical organ. Any bird developing faulty notes is removed from the rest. Little attention has been paid to the appearance of this variety, so that more often than not they are of a homely character.

The Lancashire Cobby.—The giant of the canary tribe, this first-class bird often

measures as much as $7\frac{1}{2}$ or 8 in. in length. It is a fine, bold, upstanding bird, broad in the head and firm in the shoulders, its whole appearance being that of strength and massiveness. There are plain-headed Lancashires, as well as those with a copy or crest, which differs in some respects from that of the crested, the radiation not extending backwards. The body feather is long, but not coarse. The yellows are noted for their fine colouring. These birds are not often seen outside the county after which they are named.

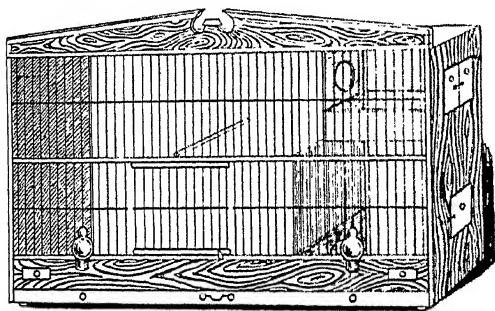


Fig. 68.—Canary Breeding Cage

The Scotch Fancy.—Many are the changes which have been wrought in this variety by the enterprise of breeders. Once the Scotch Fancy was a small slim bird, curved like a half-moon. To-day he is a big, fine, bold fellow, who stands well up on his perch, which he grasps firmly, draws up his prominent but narrow shoulders, throws out his head snake-like on a long fine neck, and brings his tail down under his perch as though it were a bit of whalebone. To the non-fancier the bird which emanates from the land of Burns is far from beautiful, and the taste for Scotch Fancies, like that for tobacco, has to be acquired.

The Belgian.—To the superficial observer the Belgian differs little from the Scotch, which has a good deal of the foreign blood in it. The head of the Belgian is carried somewhat more downwards, and the tail continues in a line with the back, instead of curving under the perch. They are usu-

ally very tame, but too eccentric to make a wide appeal.

The Lizard.—A most attractive bird on account of its spangled plumage, it is said to resemble the scales of a lizard. The yellow-spangled are known as gold, and the buff as silver. The yellow is of a dark bronzy tone, and not the colour of an ordinary canary. The spangling is caused by alternations of blue-black or black-brown with light edgings. The top of the head, or cap, should be clear in colouring. The beauty of the bird is evanescent. In its nest feathers the spangling is not apparent, only coming after the first moult, and every succeeding moult sees the colour growing paler and paler.

The Border.—This is the smallest of the canary family; not so chubby as the Norwich or so thin as a Yorkshire—just the happy medium. He is a bright, active little fellow, without exaggeration in any feature.

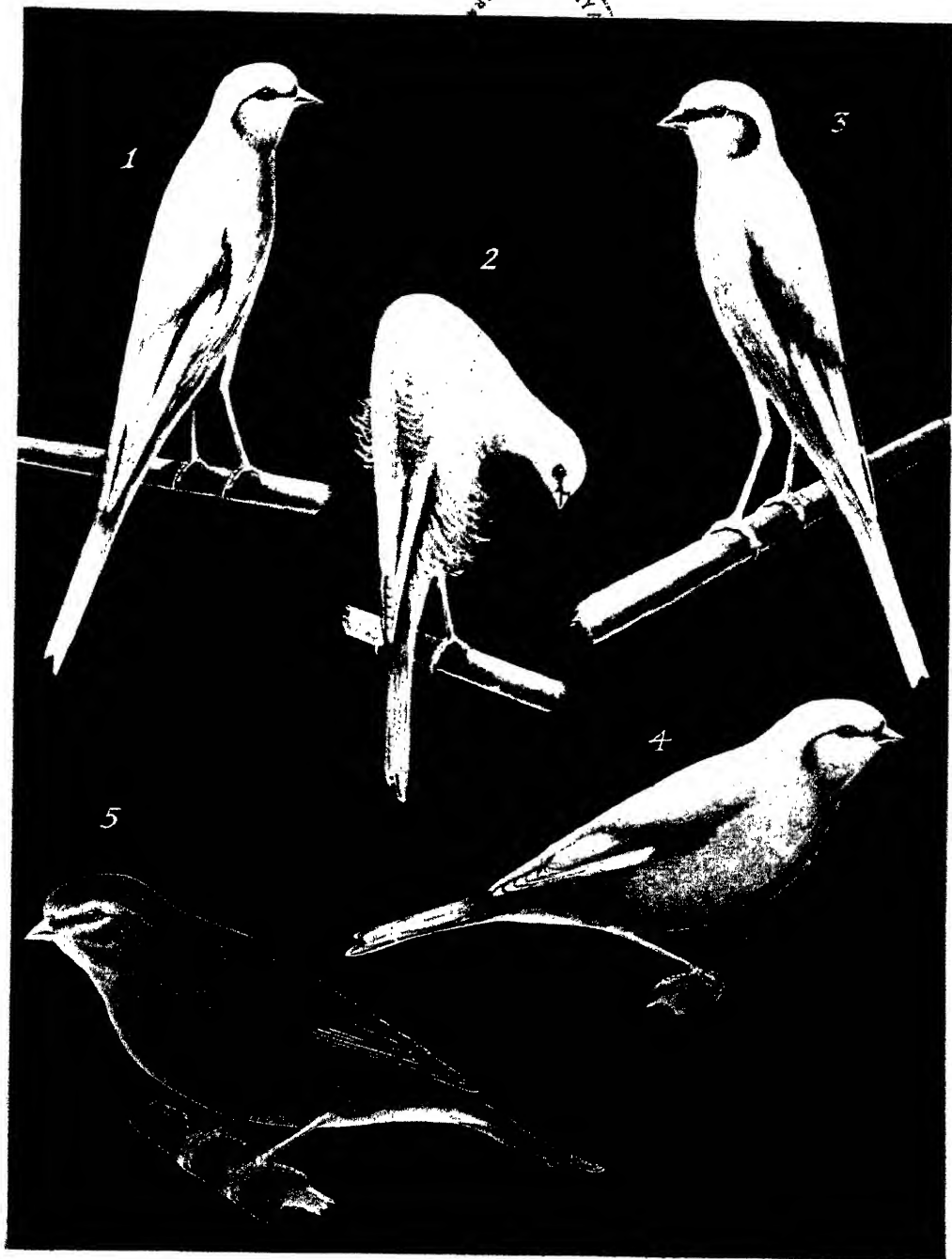
The Cinnamon.—Coloured like the spice, this bird is distinctive from the fact that it has a pink eye.

The type may be either Yorkshire, Norwich, or Border. Whichever it is, the colour gives the name. Great improvements have taken place in the coloration, which may now be had in a rich chocolate.

Green Canaries.—These may be had in any of the three types mentioned. Brilliance of colour is chiefly prized, always remembering that, no matter what the variety may be, the two basic colours, yellow and buff, are there. In the yellow, or "jonque", greens there is a greater depth of colour. Sometimes cinnamon blood is used through the hen to deepen the tone and improve the feather.

General Care of Canaries

The food for an ordinary pet canary is canary-seed and summer-rape, that is, the small red rape, with occasionally a pinch of maw, inga, or hemp seed. Green food such as water-cress, groundsel, and chickweed should be given three or four times a week,



CANARIES

1. Yellow Yorkshire. 2. Belgian. 3. Variegated Unflighted Buff Yorkshire. 4. Yellow Norwich.
5. Buff Cinnamon Norwich.

but care must be exercised to see that it is not frosty, or diarrhœa will result. Fresh water must be given every morning, and in warm weather should be renewed in the afternoon. A bath should be given about twice a week. During the moult a rusty nail should be placed in the drinking water, and a little sulphate of iron, about the size of a pea, every other day.

The cage for a song-bird ought never to be less than 15 in. long and 9 or 10 in. wide, height in proportion. Thousands of birds die every year through being confined in small cages. A bird must have room in which to exercise his wings, or he will soon die of consumption or asthma. By far the best is the oblong box shape with a wired front, such as breeders use. The inside should be enamelled, all cracks being filled up, as they harbour insects.

Diseases

It is of little use for the ordinary individual to attempt to doctor canaries; their lives hang on too fine a balance, so fine that even the expert has to be exceedingly careful in his treatment. Still, there are one or

two minor complaints which it is possible for a mere novice or amateur to cure. The *huskiness* which often affects canaries, especially during the moult, can be cured by mixing ten drops each of glycerine and whisky to a wine-glassful of water every morning, and giving it in place of the ordinary drinking water. For *diarrhœa*, begin the treatment by giving two drops of warm castor oil. Then add a teaspoonful of lime water to a wine-glassful of drinking water. Arrowroot biscuits scalded in milk may be given for a few days, as well as plain canary-seed. A little powdered chalk may be sprinkled on the biscuits.

Societies and Literature

The societies devoted to the encouragement of canary breeding are innumerable, and a list of the principal ones alone would fill several pages. Unless one intends going in for breeding and exhibiting, there is not much object in becoming a member. *Cage Birds* contains much information every week, and many cheap booklets are published. *Canaries, Hybrids, and British Birds* is an elaborate and more expensive work.

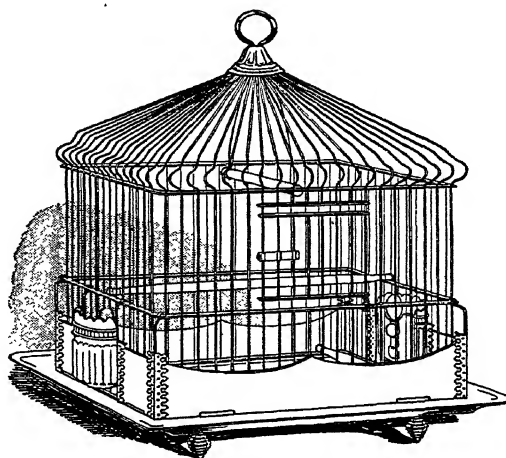


Fig 69.—Bird Cage

OTHER CAGE BIRDS

British Birds

These, as household pets, are divided into two classes—the seed eaters and soft bills. Amongst the former are the goldfinch, chaffinch, bullfinch, linnet, redpoll, and siskin. The last named are not of much value as songsters, but are capable of being trained to perform a variety of tricks, such as drawing their seed and water from a well, ringing bells, &c. The *goldfinch* is not only the most gaily attired of the finches, but he is also the best songster; and engaging as he is by reason of his rich red face, his lovely white cheeks, russet-brown back, golden wing-bars, and nice white moons, he is no less charming in the power of his song.

The *linnet*, although more soberly attired in a suit of dark brown, with dark markings and pencillings, runs the goldfinch very hard as a vocalist. His song is not quite so loud or so bright, but has a subdued quietness and softness which is peculiarly pleasing. He is a great favourite for singing competitions. The *chaffinch*, although not naturally a great singer, is capable of being trained; and in the East End of London week by week chaffinch singing contests are decided, the birds being trained under good songsters. As a pet the chaffinch is most interesting, being very bright and engaging in its manner; he is bold and easily tamed. Unless specially trained to pipe, the *bullfinch* has very little song, but when once his voice is properly developed there is no bird that can compete with him. It is not unusual for as much as £10 to be paid for a good piping bullfinch, most of which come from Germany.

Treatment.—British finches appreciate variety. The staple food may be equal parts canary seed and teazle, with a little niger, linseed, and oat grits. Give hemp sparingly. Let them have plenty of wild seeds—dandelion, knapweed, thistle, &c. Plenty of sharp grit on the floor. Green food is liked.

The Soft Bills.—Here we find the most

charming songsters, but, alas! some of them are quite incapable of being kept except by the expert. The nightingale, blackcap, and other warblers require very careful treatment, and one needs to serve an apprenticeship in the care of the hardier birds before venturing upon keeping these gems of the musical world. They are also expensive, a nightingale or blackcap costing from £2 to £3.

The *skylark* is the most popular, the hardest, and most easily managed of the soft bills, whilst its song is simply delightful. For those who have no practical knowledge of the treatment of birds we would say, give your lark a green turf twice a week, a clean, fresh-sanded cage every other day,



Fig. 70.—Scarlet Tanager

one or other of the advertised lark foods, and clean, fresh water daily, and two or three times a week a few ants' eggs or meal-worms. Also see that the cage is large enough, at least 18 in. by 14 in. This bird so loves his liberty that we do not like to see him caged.

The blackbird and thrush.—It is useless to keep either of these charming songsters unless you can give him a good roomy cage, and can find time to clean the cage

out every day. These well-known pets can only be induced to sing when they are kept scrupulously clean. Besides a large, roomy, well-sanded cage, they should be given plenty of fresh water for drinking and bathing, and be liberally supplied with shredded raw meat, worms, slugs, and snails. In giving them snails, it should not be forgotten that a large stone is useful to the birds in assisting them to smash the shell. The best staple food for these birds is the soft-billed food sold by most corn-chandlers. With regard to management, what suits the blackbird and thrush will also suit the *starling*. These spotted beauties are not of much account as vocalists, but by careful tuition they may be made efficient linguists, and they often become sufficiently tame to have their liberty.

Magpies, jackdaws, and jays.—These birds, if confined in cages, must be provided with plenty of room. A cage should not be less than 3 ft. long, 2 ft. in depth from back to front, and 3 ft. high, especially for a magpie; for the jackdaw and jay, it might be a trifle less in height. They make engaging pets for those who have the time and leisure to teach them to talk. Their treatment is similar to that prescribed for the blackbirds, thrushes, and starlings, although it must not be forgotten that they appreciate the luxury of picking a bone.

Foreign Birds

To deal fully with the many hundreds of foreign birds which are imported into Britain every year would require a volume of itself, and a large one too. We can only touch briefly upon the birds most generally known, amongst which are the Gouldian, Cuban, grass, red-headed, ribbon, parson, banded, chestnut, nonpareil, zebra, indigo, and other finches; the weavers, the mannikins, the wax-bills, budgerigars, love birds, cardinals, &c.; all of which are easily kept if given plenty of cage room, and provided with canary and millet seed, fresh water daily, and clean gravelly sand twice or three times a week. The parrots, parrakeets, lories, cockatiels, and cockatoos should be fed on the parrot mixtures which corn-



Fig. 71.—Parrot

chandlers supply, and maize boiled in water. Nuts, potatoes, carrots, and fruit make a change. Keep cuttlebone and a piece of wood in cage.

Parrots also require a large amount of grit or gravel; most bird-dealers and corn-chandlers stock parrot gravel nowadays, and lovers of these birds should see that their pets have always some in their tins. The rarer kinds of foreign birds, such as tanagers, spectacle birds, robins, bulbuls, shamas, sugar birds, honeyeaters, starlings, and mynahs, should not be kept by anyone inexperienced in the treatment of birds, as they are very delicate, and soon die if not fed and properly looked after.

Useful Publications

Useful publications dealing with cage

birds are as follows: *British Birds*, by F. E. Beddard, F.M.S. (Longmans); *British Birds for Cages and Aviaries*, by W. T. Greene (L. Upcott Gill); *Favourite Foreign*

Birds, by W. T. Greene (L. Upcott Gill); "Foreign Birds for Beginners", by Wesley T. Page (*Cage Birds*); "Frank Finn's Manual on Cage Birds" (*Cage Birds*).

THE HORSE

Purchase of a Horse

The most satisfactory way to get a good horse is to go to a well-known dealer—a man who has a reputation to lose—and tell him frankly what is wanted, or to a private person who is known for his probity. Many subterfuges and evasions of the truth are considered legitimate. An animal that has been generously fed and kept in a warm stable for a few weeks may conceal a lot of blemishes. At the same time no bargain should be concluded without an examination by a veterinary surgeon, whose fee may be 10s. 6d. or £1, 1s. Never buy unless the seller gives a "warranty" of soundness with the horse. A respectable dealer will sometimes change a horse bought from him on a warranty, even when the change is a matter of pure caprice.

Prices vary so greatly that it is useless to suggest a fair average.

A Warranty

A warranty, it may here be explained, may be general or special, or for a length of time determined on by the vendor and purchaser. A "general" warranty explains itself. A "special" one warrants some particular part; for instance, the seller may warrant the horse in his feet. A "time" warranty protects the purchaser for a pre-determined period, a month being the usual limit. A very good form of warranty is as follows:

"Received from John Henry Wells the sum of £80 (eighty pounds) for a bay mare, warranted sound, quiet in harness or to drive, seven years old, and free from vice."

At the same time specify some distinguishing mark to facilitate identification. When

the animal does not answer to its warranty, the purchaser can enter an action for damages and expenses incurred in keeping the horse until it is disposed of.

Upkeep of Pony

The advice given in reference to the purchase of a horse applies to the purchase of a pony. As the mistress may like to take the pony out by herself, it should be warranted "quiet to drive". It is not always convenient to be accompanied by a groom, and it is very unpleasant to have a restive animal to drive, one that must be held and watched with the utmost vigilance.

The cost of keeping up a small pony and cart would come to about 15s. a week in town, and much less in the country, or in a place where the pony could be turned out now and again. This is, of course, exclusive of the wages of a coachman or odd man to look after the pony and cart. The cheapest means of locomotion is a donkey and village cart. If the animal is groomed and has decent brown harness he will look smart. An allowance of a little hay and corn will increase his utility. If the trap, brougham, or other vehicle is intended for town use on wood-block paving or asphalt, rubber tyres are preferable.

Care of Horses

The management of a horse is a matter with which every person who owns a carriage should make himself familiar. It is bad policy to leave too much to the coachman or groom, as unless he is a good man who takes a pride in his charge, the horse is apt to suffer from neglect.

The first duty in the morning is to water the horse. This should never be done after a meal. After a few minutes a good breakfast of $\frac{3}{4}$ gall. oats and 1 lb. chaff should

be turned into the manger, and the water-bucket emptied and refilled, so that the horse may alternately eat and drink. A harness-horse may have from 10 to 12 lb. of oats a day. 2 or 3 lb. of crushed beans may be given daily to a horse in hard work, reducing the oats accordingly. Never feed

bristle brush should be used; the feet should be washed well, and all dirt or stones removed from the hoof. When this is done, all the head should be washed over with a small sponge; it is necessary to be especially careful about the eyes and nostrils. The process is concluded by

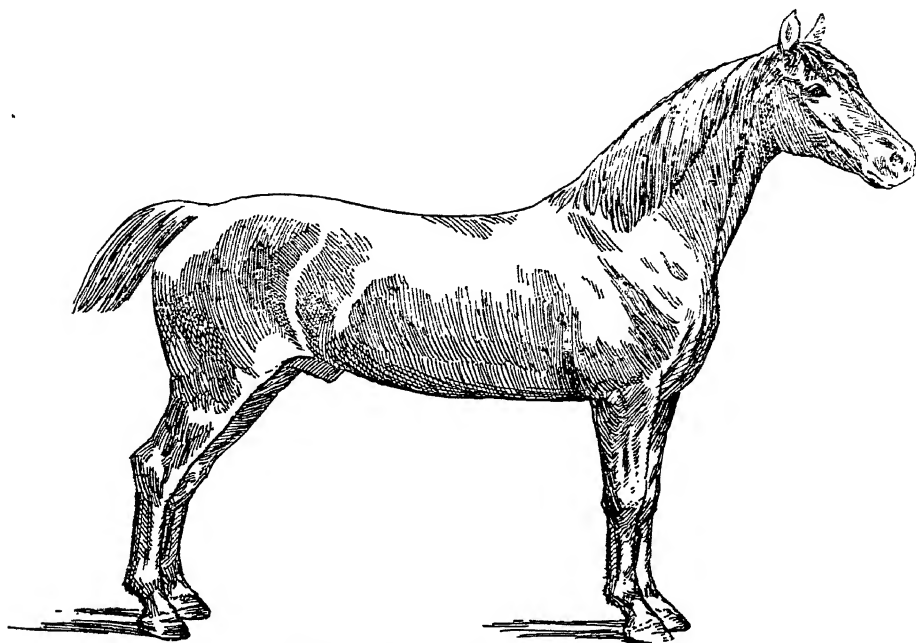


Fig. 72.—Horse: to illustrate Good Points

- | | |
|---------------------------------------------------|------------------------------------------------|
| 1. Well-formed and intelligent head. | 7. Hind-quarter cleanly cut. |
| 2. Well-arched and shapely neck. | 8. Hind limbs nicely vertical—well “pillared”. |
| 3. Withers well balanced. | 9. The belly of good form. |
| 4. Back well shaped. | 10. Fore limbs well planted. |
| 5. Loins and croup well placed. | 11. Chest well proportioned. |
| 6. Tail nicely hung, showing trace of Arab blood. | |

for less than an hour before work. When the meal is finished the water should be taken away, and not left to absorb noxious fumes, and thus become unpleasant, if not dangerous.

Grooming

After a little rest the animal must be thoroughly groomed. The first thing is to go over him well with a wisp of hay just dipped in cold water, and shaken out, so that it is no more than damp; then a stiff

drying well and going over briskly and thoroughly with the brush once more, this time doing the mane and tail.

On days when the horse will not be used until late, if at all, he should have an hour's exercise after he has been groomed. Where a stable-boy is kept as well as a groom-coachman, it will be his duty to remove the damp bedding, sort out that part of it which can be used again, and get it dried during the time that the horse is out for exercise. On returning to the stable, the

horse should have a final brush down. He cannot be groomed too much; the more this is done the better he will look, and the more fit he will be for his work. After work of any kind, the grooming must be done once more. Many men will neglect this when the hour is late, but the master should see that it is properly carried out.

Proper Treatment

The usual bedding for horses is straw, but sawdust is much to be preferred. When freshly laid it has a much cleaner appearance, and does not heat the feet as the straw does. Many horses eat their bed, and unfortunately once the habit has been acquired it is a lasting one, as long as straw is used, but no horse will eat sawdust.

Ill-treatment often causes and always aggravates viciousness, for which reason any impatience in a groom should be rebuked at once. Some horses are so thin-skinned that a bristle causes real pain to them, and the result is that they flinch and kick. In such cases the groom not infrequently ties the horse up tighter, and at every flinch it gives beats it with the brush, and if it kicks, ill-treats it still further, until after a week or two it has become confirmedly vicious at grooming-time.

Attention to Health

Should a horse develop the bad habit known as crib-biting, remove all the utensils and saw off all projections in the stable, leaving it bare of fittings. The fodder must be thrown on the floor. A crib-biter can never be kept in proper condition.

Shoeing is a matter requiring careful attention. Worn shoes are dangerous; no horse should be driven with them, for they are one of the most frequent causes of accidents.

When a horse falls ill, a properly qualified veterinary surgeon should at once be sent for. Above all, the groom should not be allowed to "dose" the animal, since he is not unlikely to give an unsuitable medicine which may delay recovery. Of course, a

mere trifling ailment is a different thing; in that case a ball or a powder, administered in time, will often save a heavy bill. Nearly every chemist, for about a shilling, will be able to mix up a ball or a powder for a slight indisposition if the symptoms are properly described.

Rules for Feeding

A hungry horse must not have his first feed on chaff alone; a few handfuls of hay pulled from the truss should be given first. A horse when hungry bolts his food, and chaff thus taken is apt to bring on colic. Beans ought to be of the previous year's growth, and should weigh at least 62 lb. to the bushel. The inside should fill the shell well and taste sweet.

Bran is one of the finest things to have in a stable, being a laxative if well-damped; it keeps the animals in good condition. To have an astringent effect it must be given dry. It spoils if kept too long. Good bran is sweet-smelling and cool to the hand; musty bran should not be purchased. Meadow-hay makes the best chaff, but green oat-straw may be used at a pinch. It should be well cut, and is more nutritive when mixed with green food or mangels.

Vegetables and Greens

Carrots and parsnips are splendid food, especially for convalescent horses, restoring them to good condition very quickly. Sliced up with a few oats and some beans they form a rich meal. It is cheapest to purchase them in the autumn, in sufficient quantity to last over the winter and early spring months. Green stuff is very good spring food if given fresh, otherwise horses are better without it. Clean lawn-clippings, mixed with hay or oats, may be given occasionally. The best of all green foods is lucerne, but vetches are commonly used.

Hay, Oats, and Maize

Hay for horses should be hard and crackling. Soft hay is of no use except for milch cows. 18 cwt. to the load is about the right weight for old, well-dried hay, and anything lighter ought not to be purchased.

Maize, being cheaper than good oats, is often used as a substitute, especially in livery stables. It should not be given unless the animals are regularly working in harness.

Oats should weigh at least 40 lb. to the bushel. The skin ought to be smooth and thin. The flavour should be sweet, and the oats themselves should look plump. It is an economy to get the best quality when purchasing.

Mashes

Mashes are very useful and necessary at times; the two kinds in general use are bran mash and bran-and-linseed mash. To make a bran mash rinse out well a wooden bucket with boiling water; put in $3\frac{1}{2}$ lb. of bran and a piece of salt the size of a walnut, pour on this 3 pt. of boiling water; stir it for a couple of minutes, cover it, and let it stand nearly half an hour. A bran-and-linseed mash takes longer to prepare. Boil 1 lb. of linseed in 3 qt. of water until there are only about 2 qt. of liquid. This will take nearly three hours. Add 2 lb. of bran and a small handful of salt, and stir round and cover up as directed in the first recipe.

Sometimes a horse refuses a mash for no apparent reason. In such a case boil up a quartern of oats and add it to the mash. The aroma of the oats often entices the horse to eat when other means fail.

Other Useful Foods

Oil-cake is useful to horses when they are changing their coats. The inferior qualities should be avoided. Potatoes and other roots are best given in hay-chaff. Rye-grass is useful at times when heavy work is being done. Salt is, as a general rule, much liked by horses. A large lump of rock-salt may be put in the manger. Sugar is wholesome when the animals are in poor condition, as it helps to fatten them up.

Harness

When buying harness, get the best. It takes up no more room than harness of inferior quality, and certainly lasts longer, in addition to looking better. Good harness is invariably hand-sewn. Unnecessary brass and plating are in bad form, and also take a great deal of valuable time to keep clean and in good order.

MONKEYS AND MARMOSETS

The best varieties of monkeys to keep as pets in Britain are the brown- and white-throated capuchins, rhesus, mangabeys, bonnet, macaques, spider monkeys, squirrel monkeys, and Diana monkeys, all of which have been kept and have done well in this country. Of these probably the capuchins and rhesus are the hardiest; and the spider and Diana monkeys require most care, and are most difficult to keep in health. There is one point against the bonnet monkey as a pet, its strong mousy smell; but this variety is most amusing, with funny little habits and very human ways. Spider monkeys are rare, and few are brought to Britain; they are very affectionate, engaging little animals.

The rhesus is the common species favoured by organ-grinders, and is hardy

enough to live outside in a sheltered spot if a warm house and run of wire-netting are provided. The squirrel monkey, not being much larger than a squirrel, is a pleasant pet.

Proper Food

The feeding of monkeys is most important. Boiled potatoes and boiled rice should be their staple food, varied by bread-and-milk. Slices of apple, banana, or any fruit may be given in small quantities. They are very fond of dry wheat and oats occasionally. They should be fed twice a day, and water given two or three times a day, but it is best not to leave water in the cage, as it is generally spilled.

Their cages should be large, square, and of galvanized wire, similar to, but stronger

than, a parrot's cage. The fastening must be secure, and of a kind not to be opened by the monkeys, who soon learn to open any handle or bolt; a padlock, locked, is the only safe fastening.

Care and Attention

Great cleanliness is necessary to keep the cage in desirable condition. It must be cleaned out every day, and the bottom thickly covered with Jeyes' or Sanitas sawdust, and the perches and swings scrubbed



Fig. 73.—Capuchin Monkey

with coal-tar soap and Condy's fluid. It is absolutely necessary that the cage be placed out of draughts, to which monkeys are very susceptible. For convenience in handling and taming them it is best to put on them a belt, and light chain or leather dog lead; the belt should consist of a piece of soft leather, sewn firmly together, as a buckle is apt to wear the hair off; but a very soft little dog collar will sometimes do as well, and is easier to put on.

Insects, birds' eggs, &c., are appreciated. As adult males often become bad-tempered, a female is preferable.

Treatment in Sickness

Chest diseases, coughs and colds, should

be treated exactly as in the human patient: keep warm, and at once give cough medicine, and the ordinary remedies for cold. For constipation, give a little magnesia in milk; for diarrhœa, dry rice and rice water. When they are a little ailing, a raw onion often works wonders in the way of a cure; and they may be seen to rub it on their bodies to benefit by the external application also.

Marmosets

These pets need great care and great warmth. They have bred in Britain, when kept in a warm greenhouse, with a hot-water bottle under the nesting box, and the tiny babies at three months of age are quite human and recognize their friends. Apart from temperature, the chief danger in breeding is from the mother, for she often kills one or more of the young ones before they are rescued. The infants have to be fed with milk administered by a medicine-dropper or pen-filler.

Suitable Diet

The diet of grown marmosets needs care and thought, as they are capricious in appetite. A teaspoonful of milk, in which are three drops of nux vomica, may be given as breakfast, to ward off the paralysis which always threatens these tiny animals in Britain. They are insectivorous, and should have mealworms every day, occasionally spiders, large moths, and other insects. Their chief food is rice pudding, rather sweet, or rice boiled with sultanias; a piece about the size of a walnut is a meal for a full-grown marmoset. They will eat sponge cake, biscuit, and bread-and-milk, and should have fruit—banana, apple, grapes, &c.

A little round straw bird's nest is a good sleeping place for them; and their cage, which should be wired only in front to avoid draughts, should be in a very warm place where there is no danger of a sudden fall of temperature; a cupboard over a hot-water tank has done well. They are very sociable, and therefore much happier if kept in pairs.

FARMYARD PETS AND STOCK

Rabbits as Pets

Fashions have changed a good deal in rabbits. Certain of the commoner sorts will always be kept by the children, but prettier ones might be chosen than the heavy, sluggish, lop-eared, which is seen so much. The smaller Himalayan, for instance, is very

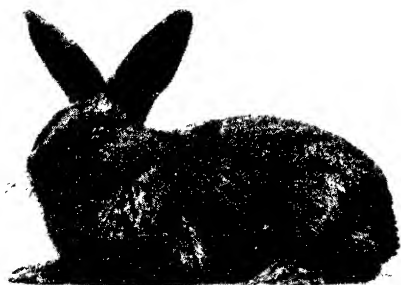


Fig. 74.—Blue Beveren Rabbit

smart, with its white body and black ears and nose. The Dutch, too, one of the tiniest. Its body is self-coloured—black, blue, grey, tortoiseshell, or lemon—with a white collar round its neck, and blaze of white up its face. The does are excellent mothers. Since the war, however, special attention has been given to their utilitarian qualities, many now being bred either for the table or for their fur.

Breeding for Profit

The Angora rabbit has for long been a source of profit to the French peasantry, its long white wool being plucked, and either sold, or woven into under-garments. The coat should be combed several times a week, beginning when they are young. In France they are partially plucked every six weeks, the animal feeling no pain if the wool is in the proper condition. This is when it can be removed easily and the skin does not become red. Among those with pelts of considerable value are the chinchillas, whose

skins may be worth from 5s. to 20s. apiece. They are said to be a close imitation of the wild animal. In France the principal rabbit of this class is known as the Champagne Silver.

Big, short-haired white rabbits come next in order across the Channel. We have nothing similar in this country at present, our whites being too small. The winter coat of Havanas in England is excellent, the colour being a self-chocolate. Blue Beverens are also much bred, although their fur does not resemble that of any of the wild fur-bearing creatures. Skinning should be done before disembowelling, so as not to soil the fur. The skin, which comes off inside out, should be carefully filled with straw, just sufficient to prevent creases, but not so tight as to stretch, and then it should be hung to dry in a current of air.

Breeding for Table

Different breeds are reared for the table, the leading idea being to get a rabbit carry-



Fig. 75.—Angora Rabbit

ing as little offal as possible, and one that matures quickly. A squarely built, heavy rabbit is the standard to be aimed at. Flemish Giants are much in favour on account of their great size, the weight of

a doe being about 13 lb. and of a buck, 11 lb. No stock animal that weighs less should be used. Then come the Belgian Hares, which should be chosen with discretion, those with extreme length of leg carrying a lot of offal.

Care of Rabbits

The roomier the hutches the better. A width of 3 ft. with a depth of 2 ft., and about 18 in. high will do, but the breeding hutch may well be 4 ft. 6 in. wide, so as to admit of a division 1 ft. 3 in. wide as a dark sleeping chamber. The floor should have a little slope for drainage purposes.

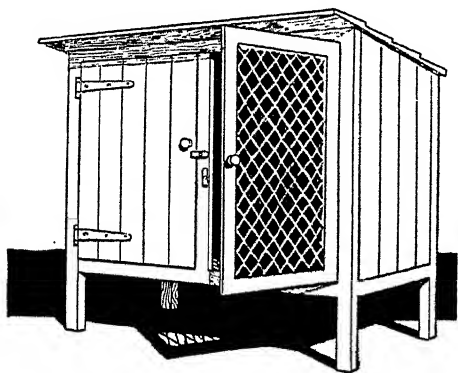


Fig. 76.—Portable Rabbit Hutch

If the floor is covered with zinc, and a second floor above it is made of $\frac{1}{2}$ -in. lath 1 in. apart, the inmate will keep clean. Oat straw over sawdust is the best bedding. Vary the food. Cabbage and lettuce leaves, dandelions, grass, groundsel, and hedge parsley are all liked, but beware of hemlock, which is a poison. Scalded bran, a handful of oats, sweet hay, swedes, carrots, Indian meal, boiled or scalded (in cold weather) are all recommended.

The young up to three months should have some crushed oats and bran. Never give wet or frosty greens. Let them have fresh water daily. Potatoes, or their parings cleaned and boiled, are useful as a change. Scrupulous cleanliness should be observed.

Common Ailments

Diarrhœa is one of the commonest com-

plaints, usually attributable to too much green food, or giving it wet or stale. Put on to dry food, such as crushed oats and bran, with a dozen crushed juniper berries. A powdered acorn in each feed is valuable as an astringent. Pot belly, or dropsy, may arise from too small a hutch, dampness, or wet green food. Give dry food, and allow plenty of exercise.

A Cow

The care and breeding of livestock is too complicated a matter to admit of being dealt with satisfactorily in a limited space. Practical knowledge is necessary if one is to meet with success, such as can only be obtained by actual experience on a farm. Those who desire to keep a single cow that will supply the household with milk and butter, however, can derive much assistance from the books enumerated below. For this purpose a Jersey is the most suitable, being small and docile, and a prolific yielder of milk rich in butter-fat. The Kerries and Dexters are still smaller, and have the advantage of thriving on poorer fare than would be offered to other breeds. People with limited land are unlikely to have any sheep, unless they want one or two for cropping the grass left by the cows.

Goats for Milking

Goats come within a different category, having been well described as the poor man's cow. Their usefulness is much underrated, for they cost next to nothing for their food, are easily managed, and, if the right breed is chosen, give a fair amount of milk, which is of exceptional purity and is easily digested, the fat globules being smaller than those in the milk of the cow. It is necessary to get one of the free-milking sorts, such as the Toggenburg or Anglo-Nubian, or the progeny of one of these crossed with an English goat. This alliance often has very profitable results, and the crosses are much cheaper than the pure breeds. A Toggenburg, giving a gallon in the two daily milkings, costs comparatively a lot of money, but a crossbred should yield for a time after kidding at least 3 pt.

a day, say for three months, 1 qt. for the next three months, and thence onwards a pint until she goes dry.

Treatment of Goats

It is advisable to buy a young nannie that kids in March, the period of lactation then

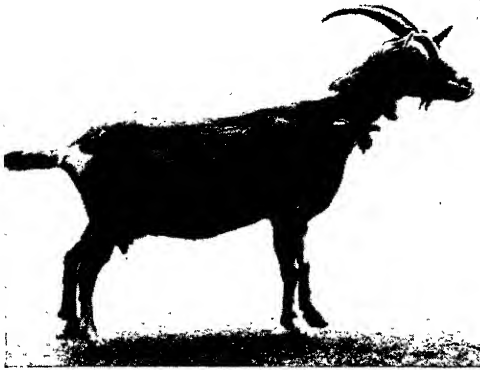


Fig. 77.—Toggenburg Goat

being the longest. A small shed littered with peat moss will suffice for accommodation so long as it is watertight. Goats may be tethered out in spring and summer, but a frequent change of ground must be given, and they should not be left out in the wet. The tether must be either a chain or a rope composed of several strands of wire twisted together. If a long rope is pegged at both ends, and the animal attached to it by a short chain and collar, more liberty is possible. From October to April the animal should be indoors, the grass then having little feeding value. Almost any garden produce, including clippings, will be welcome, but avoid rhododendrons, yew, and laurels, which are poisonous. Vary the menu. Hay should be placed in a rack with bars not more than $1\frac{1}{2}$ in. apart to prevent waste; oats and chaff, bran, either dry or as a mash; chopped roots or potatoes; middlings or sharps with chopped vegetables; broken bread, bits of toast, porridge, &c. Nothing seems to come amiss, but the bucket in which the food is presented must always be kept scrupulously clean.

For the summer months, if one has a paddock or good-sized kitchen-garden, the weekly cost should not be more than about 1s. For the six winter months the total will be about £1, 10s., making no allowance for labour. That is allowing an average of 2 lb. of hay a day, $\frac{1}{4}$ lb. of oats, and 2 oz. of bran. This would leave a decent profit on the current value of milk, and would ensure one getting milk free from tubercle, and containing the minimum of bacteria. At least, if there were too many of the latter the fault would lie in not observing the laws of cleanliness. Put up a small platform upon which the nannie can stand at milking time. Milk quickly, and be sure that the udder is thoroughly stripped each time.

Books of Reference

Cattle: Breeds and Management, by William Housman (Vinton & Co.); *Sheep: Breeds and Management*, by John Wrightson (Vinton & Co.); *British Breeds of Livestock* (Ministry of Agriculture, 3 St. James's Square, price 3s. 6d.). A leaflet on the management of goats may be had free on

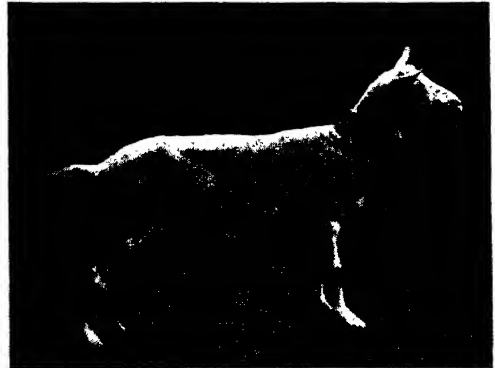


Fig. 78.—Anglo-Nubian Goat

application from the Ministry, which is continually issuing practical advice in this form.

The Dairy

(See p. 147.)

THE POULTRY-YARD

Various Breeds

The origin of the many breeds of domestic fowls which inhabit our poultry-yard is generally attributed to the *Gallus Bankiva*, the Red Jungle Fowl of India, although some doubts have been raised as to the correctness of the assumption. The breeding of poultry is now a science. Shape, colour, and external characteristics used to be the chief aim; but now more useful qualities also receive attention, with the gratifying result that the eggs have increased in number and size, while chickens are produced which carry more meat at an earlier age than heretofore. The best laying fowls are very poor meat-producers; the best table fowls and the meat-growers are very indifferent layers. The two qualities are not found in highest excellence in one breed, although there are many breeds which are fairly good in both respects.

This, then, is an instructive way to consider the breeds of poultry: (a) the laying breeds; (b) the table breeds; (c) dual purpose breeds, those which more or less combine the two qualities.

Layers.—Ancona, Andalusian, Campine, Hamburg, Leghorn, Minorca, Redcap, and Scots Grey.

Table Poultry.—Dorking, Old English Game, Indian Game, and Sussex.

Combined Qualities.—Faverolles, Houdan, Langshan, Orpington, Plymouth Rock, Rhode Island Red, and Wyandotte. These, with the exception of the Houdan, lay brown or cream-coloured eggs.

Laying Breeds

The egg-producers, as a class, are medium in size, active in habit, quick to arrive at maturity, non-sitters, and layers of white eggs. Fowls which lay coloured eggs invariably possess and exercise the incubating instinct. The chickens of the following breeds provide good food for the private table, but it is waste of money to attempt to fatten them for the public market, on which they would only realize the bottom price.

Ancona.—This is a small fowl, colour beetle-green with white tips to the feathers; comb single, or rose; legs yellow, mottled with black. In habit it is very active, and gives better laying results when allowed complete liberty than when penned up, being of a wild disposition. It is a non-sitter, and free layer of large white eggs. The chickens are hardy and easily reared.

Andalusian.—A medium-sized fowl, colour slaty-blue, with black lacing to each feather. Belonging to a Mediterranean tribe of poultry. It has the characteristic comb—upright in the cock and falling over in the hen—the white almond-shaped lobes, and the pendulous wattles. These typical points are well depicted in the illustration (facing) of the Minorca, a first cousin to the Andalusian. Their legs are a dark blue, almost black. The hens are capital layers of very large white eggs, and non-sitters. The chickens grow quickly, and the pullets commence laying at an early age. The chief drawback to the Andalusian is that even the purest-bred and best-marked parents produce a number of wholly black or white chickens. However, this fault is being gradually eradicated from some strains. The Andalusian can confidently be recommended as a hardy, free-laying breed suitable for confinement or for a free range.

Campine.—This Belgian breed was originated and developed for utility purposes, and is capable of an excellent egg production—more especially in the Silver variety. The eggs are of good average size, about eight to the pound. It is not unlike the Pencilled Hamburg in general appearance, except that the comb is single instead of rose. Small in body, its table qualities are of only secondary account. It is hardy and active, and its disposition to restlessness makes it more suitable for a free range than the close confinement of a run.

Hamburg.—A small-sized breed, found in five varieties, of which the gold and silver spangled are the largest. Then in point of size comes the black, the smallest

being the gold and silver pencilled. The Hamburgs used to be known as "every-day layers", so prolific were they in egg-production; but the size of the egg is certainly below the average. This and a certain delicacy of constitution are their worst points. The five varieties have the same rose comb, round white lobe, neat wattles, slate-coloured legs, and graceful, alert carriage, depicted in the coloured Plate. The beauty of their plumage deserves a lengthy description; it must, however, suffice to say that in the Gold and Silver Spangles a lustrous green-black half-moon finishes the rich bay and clear white of the feather, and in the Pencils fine narrow bands of black run across the feathers. The Blacks take their name from their colour, but the black must be very lustrous and green, not purple. The Hamburgs are non-sitters and very active in habit, doing best in roomy quarters. For utility purposes the breed has suffered as the result of breeding for exhibition, but some strains are much better than others in this respect.

Leghorn.—As the name implies, this breed is of Mediterranean origin, and has the characteristic head features; but the colour of the leg and beak is yellow, and with this is found almost universally a yellowish colour of skin. The Leghorns are thoroughly good layers of large white eggs, and are non-sitters; the chickens are hardy and mature rapidly. They are active in habit, good foragers, and with liberty find a good deal of their own food. The two varieties most frequently developed for egg production are the White and the Black. The white should be a clear dead, not yellow, white in colour. They are admirably adapted for a free range in a clean atmosphere. Every farmer who makes egg-production a feature of his farm should have a stock of White Leghorns. The Blacks and Browns—less likely to look dirty—are more suitable to pens or town enclosures. The Buffs are entirely a buff colour. There are also Blues, Cuckoos, Duckwings, Mottled, and Pile.

Minorca.—Another of the large Mediterranean family; this is a goodly sized bird,

black all over in colour. The head, as will be noticed in the Plate (facing p. 96), is typical of the tribe, the legs black in colour. Minorcas are good layers of big white eggs, if not over-developed for exhibition, and non-sitters. They can be profitably kept either at large or penned up. There is very little to choose between them and Andalusians. If anything the Minorca is the larger, the Andalusian the stronger and the better winter layer.

Redcap.—A coarse variety of the gold-spangled Hamburg, much larger in size, stronger in constitution, and a free layer of larger eggs. The comb is of the rose type, very much exaggerated in shape and size. They are non-sitters and the chickens are somewhat difficult to rear. This breed may be cited as an instance of the fact that a breed which the poultry-fancier does not take up makes very slow progress in popularity in spite of its undeniably economic qualities. As an egg-producer the Redcap deserves to be kept much more freely than it is. When matured it is a hardy fowl, and on a good run requires little attention.

Scots Grey.—This breed is found chiefly in Scotland. The fowl is moderate in size, with red ear-lobes and white legs with black spots. The colour of the feathers is generally known as "cuckoo", that is, a grey ground colour with black bars or markings running across the feathers; in fact, not unlike the colour of the Plymouth Rocks shown in the Plate. They are very fair layers of cream-tinted eggs, and capable of development into prolific strains, uncertain as to sitting, easily reared, and fare equally well whether penned or given liberty. The breed is very rare in England.

Table Poultry

All the table breeds lay relatively small eggs, generally brownish or cream-tinted, in proportion to the size of the birds, and all of them have the sitting instinct strongly developed.

Dorking.—This, an old English breed, is admitted to be one of the best pure-bred fowls. A careful reference to the coloured Plate will show the great size of the dark and

silver-grey varieties, the whiteness of legs and feet, each foot having five toes, and the length and depth of the keel-bone.

The dark Dorkings are the largest and most massive; the Silver-Greys are nearly as large but stand higher from the ground; the Whites, although of considerable size, are the smallest of the three. For so large a fowl, Dorkings are fairly active; they lay a medium-sized egg, and are good sitters and mothers. The chickens are somewhat delicate, and mature slowly. When fully grown, even if fed in the ordinary way, they make capital table birds, and when artificially fattened attain great weight and high quality of meat. Dorkings require a dry soil, free range, and plenty of room by day and night. The White Dorking can be recommended to those who desire a fair number of eggs and large chickens for table, white in skin, flesh, and legs. The breed is best crossed with the Indian Game.

Old English Game.—The Old English Game is the fighting-cock of history. It is only suitable where there is ample room. The hens are moderate layers, good sitters, and most courageous mothers, resenting any interference with their nest or chickens. The chickens are delicate and slow growers. The *Modern Game* differs very materially in shape, for whereas the Old English Game is a short-legged, full-feathered, broad, "cloddy" bird, the Modern Game is very long in the legs and neck, and very fine and short in feather. A pair of Black-Breasted Reds are shown in Plate (facing p. 96). It is customary to cut off the comb, wattles, and ear-lobes of the Game cocks. The operation known as "dubbing" is painful, and should only be performed by a skilled hand. It is necessary, because the Game cock is a most pugnacious fowl, and suffers terribly in fights if these parts are not removed. When dressed, the chickens are small, but the fineness of their skin and their delicate meat is held in high esteem.

Indian Game.—This is a very handsome and very useful breed, totally different from those just mentioned. Comb very small, legs, beak, and skin yellow, plumage extremely handsome, a mixture of glossy

green-black and maroon. The feathers of the hens are most delicately laced in black on a chestnut-coloured ground. They are thick and "cloddy" in shape, with very broad and full breasts, layers of heavy-coloured eggs, and admirable mothers. The chickens are easily reared, but not very rapid growers. As a cross with the Dorking the Indian Game is in great demand; the progeny comes to hand much sooner than the pure Dorking, and when fattened produces the class of fowl which fetches the top market price for size. The cross with Dark Dorking hens is the best; but when mated with Houdans, Langshans, or Orpingtons, capital chickens are obtained for killing purposes.

Sussex.—An old English breed of the table type; this fowl was originated for the practical purpose by the chicken rearers and fatteners of the county from which it derives its name. The chickens are rapid growers, capable of considerable flesh development, and respond freely to the fattening process. For very many years the breed has occupied a foremost place in the estimation of market producers. It is naturally hardy, and suited to conditions of either freedom or confinement. It normally lays a sufficiency of eggs for those who hatch and rear table birds by the natural method, laying and sitting alternately at convenient intervals. But latterly the Light variety has been more especially bred by many for improved egg production, and has consequently approximated more nearly to the dual-purpose type—or even, in some cases, that of the laying breeds. The breed, as a whole, is a good producer of eggs in winter, and thrives in most situations. There are four colour varieties, viz. the Speckled, Red, Light, and Brown.

Combined Qualities

Faverolles.—This breed originated in France, primarily for the table poultry trade, but has been bred here as a dual-purpose fowl. The most popular of its varieties is the Salmon Faverolles. The head has ample muffling and beard; the body is broad and deep, breast full and wide,

thighs and legs short, the legs slightly feathered, and the feet should have five toes. In colour the cock is suggestive of the Silver-Grey Dorking, but the hen is fawn colour on back, shoulders, and tail, with a lighter shade of the same colour on her breast and under fluff. Faverolles are large, very hardy, and good winter layers. They lay a number of eggs before becoming broody, and, being very tame and easily handled, they make most desirable mothers. The chickens grow very quickly indeed, and are reared without difficulty. The Faverolles is one of the most useful all-round breeds before the British poultry-keeper, giving excellent results whether kept in confinement or allowed complete liberty.

Houdan.—This is a French breed, which, until the introduction of the Faverolles, was most common in this country. They are a crested breed, with muffling and beard (see Plate facing p. 96); each feather is black mottled with white, while the foot should have five toes. The strange formation of the comb will be observed in the illustration, where the smooth, full, but compact crest has been carefully drawn. The Houdan is an excellent layer of large white eggs, and a non-sitter; the chickens almost rear themselves, and mature rapidly. The skin and meat are very white and fine in quality, so Houdans take high rank for the table. Like all crested fowls, the Houdan prefers a dry situation; it is not suitable for damp, heavy soils; and unless it is hatched early in the season, cannot be depended upon for eggs in winter. The Houdan is invaluable for crossing with many breeds of fowl.

Langshan.—This is a very old breed of poultry imported from China. Both cock and hen are a lustrous beetle-green black; the body is large, breast and back long. In the Modern type the legs and thighs are long, causing the fowl to look very tall. The Croad is, however, a shorter-legged, heavier-looking bird, and is the original utility type. The Langshan is a first-rate layer of very dark-coloured, large eggs; a good mother to her chickens, which are not very difficult to rear. The meat is fine, white, and delicate.

The Langshan is a very useful, handsome breed, hardy and active in habits.

Orpington.—The first Orpingtons were black, with the green sheen of the Langshans; now we have them white, buff, blue, cudloo, jubilee, and spangled. The single-combed variety is by far the more common, the rose-combed varieties being rarely seen. In shape it is a massive, heavy, short-backed, full-breasted fowl, standing on short legs quite free from feathers. The hens are, or rather were, good layers of large dark-brown eggs; lately they have shown a great tendency to become broody after laying a very few eggs. The chickens are reared without difficulty and soon grow large enough for killing. For a time the Black Orpington was a most popular fowl, lately it has yielded its place to the Buff and White Orpington. The Buff was produced by the introducer of the Blacks, but from quite different breeds. Still, the ideal shape of the Buff is the shape of the Black. The Buff Orpington marks a distinct advance in poultry culture, for, along with the Faverolles, it combines two valuable points in a utility all-round breed, namely, the white leg and the production of large, dark-coloured eggs. The Buffs and Whites are capital layers, trustworthy as mothers, suitable either for an open or a confined run.

Plymouth Rock.—An American breed, which, in the Barred variety is blue-white or grey in ground colour, with black stripes or bars across each feather. Like all the American breeds, the Rock has a yellow beak and yellow legs, as shown in the coloured Plate. The Rock also has a yellow skin, and produces large, tinted eggs. It is a big bird, but much of its size and weight is in the bone; hence, as a market fowl, it is often classed as "coarse". The Rock is a very hardy fowl, and will thrive on wet, cold ground unsuitable to other breeds. Neither the White nor the Buff is so popular here as the Barred variety, but in America the White Rock is considered a most useful all-round fowl.

Rhode Island Red.—As the name implies, this breed was originated in America, and has gained considerable popularity in

this country during recent years. Although of the dual-purpose or combination class its capabilities as a layer, when specially bred for egg production, have been amply proved by the records of egg-laying tests. But the cockerels make very good table birds. The eggs average about seven or eight to the pound. The breed is generally hardy and vigorous, the chickens grow rapidly and are thrifty, and the rich red colour of the plumage is attractive to the fancier.

Wyandotte.—Another American, consequently yellow in beak, leg, and skin. The body is large, very compact, and "cloddy"; back broad, breast full and broad. The Wyandotte is found in many varieties. The first to arrive here was the Silver-Laced, the Gold-Laced (facing p. 96) following soon afterwards. There are also the White, the Buff, and a beautiful sub-variety, the Buff-Laced. The Wyandotte, when given liberty, is an excellent forager, but if kept in pens its tame disposition reconciles it to confinement. It will be found a good layer of a pretty brown-coloured egg, a trifle below the average size. The chickens are managed without difficulty. They are somewhat slow at producing their adult plumage, but are ready for eating well within the average time. The White variety has been extensively used by producers of laying strains, and with White Leghorns constitute the bulk of the birds entered in laying tests.

Best Breeds for Different Conditions

This list does not exhaust the known breeds of poultry, but contains those most commonly met with and likely to be kept by the ordinary poultry-keeper. It may help him to make a selection, but the breed or variety he himself prefers is likely to be the one with which he will be most successful. For laying purposes Andalusians or Scots Grey, particularly in cold damp quarters; White Leghorns, White Wyandottes, Brown Leghorns on free range or in pens; Minorcas or Black Leghorns if the atmosphere is dirty, such as would be the case on runs near a town, where a white fowl would soon look

very begrimed. For table, Dorkings, if the ground is dry and the fowls can have freedom, and the cross with the Indian Game Cock, and the Sussex for marketable birds. For general utility, Buff Orpingtons, Salmon Faverolles, Wyandottes, or Langshans, or, if the fowls are kept in pens, the Faverolles or Wyandottes.

Cross-Breeds

Pure-bred poultry lay quite as well as crosses, especially if the cross-breeding is not judiciously carried out. By cross-breeding is meant mating together two pure breeds. In mentioning them, the breed of the male parent is written first. Good laying results are obtained from the Minorca-Langshan, Houdan-Leghorn, Leghorn-Wyandotte, Redcap-Minorca, Houdan-Rock. For table poultry, the Indian Game-Dorking and Indian Game-Faverolles produce the largest birds. A plump but slow-growing chicken comes from the Old English Game-Dorking. For general utility, Houdan-Langshan and Houdan-Wyandotte may be tried. In cross-breeding always select a pure-bred male bird; never use a cross-bred one. If it is determined to breed from the cross-bred pullets, although it is preferable not to do so, select a suitable pure-bred male, but do not use the progeny of this second cross for breeding purposes. A White Leghorn cockerel crossed with most breeds improves laying.

Selection of Stock

A convenient way to calculate the age of a fowl is to ascertain the number of times it has moulted or passed through the annual operation of renewing its feathers. It has its first adult moult in the second autumn of its life. During the moulting period a fowl ceases to lay; each succeeding moult occupies more time and takes longer to perfect. A fowl is at its best before and after its first moult; this is the time when the greatest number of eggs are laid, the eggs being of the largest size. As soon as a fowl commences to cast its feathers the second time in its life, its room is preferable to its presence in the poultry-yard. One half,

then, of the stock should be birds which have not moulted; the other half should consist of birds which have had one but not two moults. The loss which sometimes arises in keeping poultry may often be attributed to the fact that the stock consists of a number of old fowls past their most fruitful age.

Mating Birds

For breeding purposes a cock or cockerel mated with hens is better than a cockerel mated with pullets. If, on account of their tendency to lay early in the season, pullets are selected, they should be mated with an adult cock, a bird which has had one thorough moult. Chickens descended from adult parents are stronger, healthier, grow more rapidly, and attain a larger size than those bred from young stock. The breeding stock should be selected on account of its egg-producing qualities, or, if meat-producers are required, on account of its size, fineness of bone, and quality of meat. Eggs used for sitting should be laid by the earliest and most frequent layers of the largest eggs. If space permits, three or four of these fowls should be located quite apart from the main flock, or penned up for a few weeks with a male bird whose mother is known to have been a good layer.

If he is the son of indifferent-laying parents, although he is mated with good-laying hens, his chickens will not be such good layers as their mothers, and the poultry-keeper will have taken a step backwards. The plan of turning down a fresh cockerel every year is therefore not to be commended, unless it is known that he inherits good-laying qualities.

In-Breeding

Mating together fowls related to one another is neither dangerous nor detrimental unless carried to excess. By judicious and scientific in-breeding, the various breeds and varieties of poultry have been made, and by its use the desired points of excellence have been so deeply bred into a strain that they have become hereditary. A poultry-keeper who has a yard of show fowls or a

flock of layers of known excellence is most careful how he introduces alien blood, for if this be done carelessly the work of years may be at once undone.

If the poultry-keeper every year gives away a sitting of eggs or a cockerel or two to friends, and keeps a memorandum of the transaction, he will be able as time goes on to obtain from such sources fowls possessing some of the blood of his own flock, which will be sufficiently alien to counteract any failing tendency he has noticed amongst his birds. And such a tendency will be evidenced by a decrease in the number and size of the eggs, delicacy of constitution, liability to sickness and disease, infertility in the eggs, failure in hatching out fertile eggs, and debility and slow growth amongst the chickens. Many of these symptoms may arise from other causes, but if he has been in-breeding closely and they are present, it may be taken as a warning that the introduction of fresh blood is desirable.

Food and Feeding

A complete dietary for poultry includes grain, vegetables, flesh, water, shell, and grit. One reason why fowls thrive better when they enjoy complete liberty is that they can then supply themselves with vegetables in the shape of grass, flesh in the shape of grubs and insects, and grit in the shape of the small stones and bits of earth they pick up. They require other food than grain alone, although it is probably their staple food.

Different Corn Foods

For corn a selection can be made from oats, wheat, and maize or Indian corn. These can also be obtained ground into meal and when given in this form are known as soft food. Several excellent foods may be obtained from manufacturers, who grind and mix various ingredients, making balanced rations; these may be styled prepared foods. Each grain has some definite value as a food. Oats are the best for egg production, and therefore should be given to fowls regularly. They are not a good food for young chickens unless ground (not crushed) into very fine flour. Wheat is one of the best all-the-year-

round foods; it is also a bone producer, and therefore suitable for growing chickens. Barley is a heat-producing food, and useful for fattening but not general feeding.

Maize as a Food

Maize or Indian corn is a most dangerous food when carelessly given, yet a valuable one if properly used. Its danger lies in its fat-forming nature, its value in its heat-giving power. Fowls fed all the year round on maize are fed in a most expensive manner. After a very brief time their bodies become so loaded with fat that they are unable to assimilate more; they become unproductive and diseased. Fowls in close confinement should have little maize—the heavier breeds, if in pens, seldom; these include Dorkings, Orpingtons, and especially Plymouth Rocks. The lighter breeds, the good foragers, if on an open range, do not suffer so much by continually eating maize, if it be given so sparingly that they are always hungry and on the move for other food, thus continually taking exercise.

The value of maize consists in its warmth-giving nature, and therefore it is a useful food if given in great moderation during the winter months. It may also be fed to chickens in the kibbled form, particularly if they be scantily feathered, and to fowls during the moulting period. Lastly, it is a capital food for the hen while sitting.

Meal

The feeding value of these grains is not materially changed when they are ground into flour. From oats we obtain ground oats. Improperly ground it is a bad food; properly ground in the Sussex manner it is the best soft food for adult and young stock. It is better than oatmeal, and as it contains the husk of the oat very finely ground up, is a better bone producer. Ground oats must not be confused with crushed oats or "mung". Wheat gives sharps, fourths, or middlings—different names for the same thing—and bran. Barley gives barley-meal; most samples are very coarsely ground, and contain a quantity of dirt and rubbish, but a good sample may be used in fattening.

Vegetable Food

Fowls which have access to grass can supply themselves with vegetable food; if they are in pens this food must be given to them as regularly as corn. The importance of a daily ration of vegetable food cannot be overestimated. Garden refuse, lettuce, cabbages, and dandelions are eagerly eaten.

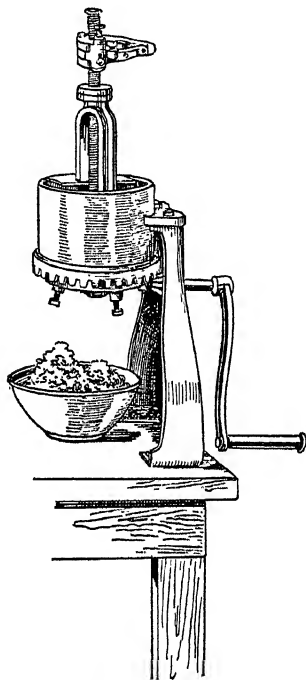


Fig. 79.—Green-bone Mill

In winter, turnips, swedes, or mangolds may be boiled and mixed with the soft food, or simply cut into pieces and thrown down for the fowls to peck at. The absence of vegetable food is frequently the cause of the yolk of the egg being a pale straw-colour; the rich yellow-coloured yolk of the country egg is accounted for by the ample vegetable diet.

Flesh Food

Meat or fish is desirable for laying fowls and should be supplied as regularly as vegetable food. The refuse from the kitchen

should be sufficient for a few fowls; every bone, cooked or raw, should be thrown to them just as to a dog, and will be picked as clean. For a number of fowls, liver may be chopped up, or lean raw "scraps" can be bought from the local butcher's shop at a very cheap rate, and treated the same way. A good way of supplying the meat diet is to use a green-bone mill (fig. 79), by the aid of which raw bones are scraped or cut up into minute pieces greatly relished by the fowls, and supplying the flesh and nitrogenous diet so essential to them.

It may be necessary to observe that green bones cannot be bought ground up in bulk; they must be the product of fresh and raw bones, of which two or three pennyworth can be bought twice a week, and a few minutes' daily work of the mill will convert them into a food worth as many pounds. Crushed green bones can be supplied to a few fowls by smashing up raw bones with a hammer on a piece of iron. This is laborious and wasteful, but may suffice.

Meat Meal

Nowadays there are many forms of so-called "animal" food prepared from meat and fish and sold as meals. Nothing could be better to provide the protein needed in a good egg-producing ration than a sound meat meal or genuine white-fish meal. It is important that the latter should be made from white-fish only, as the inclusion of herrings introduces too big a percentage of oil and is liable to taint the eggs, whilst the use of fish refuse usually means that the percentage of salt is too great—with poisonous effects. The leading manufacturers have agreed to a standard for white-fish meal in which albuminoids are not less than 55 per cent, phosphate of lime not less than 16 per cent, oil not more than 5 per cent, and salt not more than 4 per cent. Fish meal should be bought upon this guarantee.

Grit and Lime

Sharp grit must ever be before poultry. Broken flint makes good grit provided the pieces are not too large; sweepings from gravel walk, or, best of all, from roads mended

with granite, will serve the desired purpose. Lime is also necessary to supply material for the formation of the egg-shell. Old mortar, oyster or cockle shells pounded down to very fine pieces, are commonly used; the latter should always be well baked to destroy any putrid remains of the oyster. Shell-less eggs indicate that the hens require more lime.

Water

Water must never be withheld from poultry; stone or earthenware vessels are best to use, because they can be kept quite clean, and it is most essential that the water be always pure and fresh. If the water-supply runs short for a time, fowls often become so thirsty that they drink to excess on the first opportunity, and cause relaxation of the crop. A natural supply of pure fresh water is a great advantage to a poultry-run.

Rules for Feeding

The rule for feeding fowls is very simple, but difficult to carry out. It is briefly this; stop feeding birds just before they are quite satisfied. It is impossible to give the quantity of food per head for each fowl, because, as a practical man knows, the appetite of fowls varies just as does his own. The average approximate quantity per bird per day is 4 oz. of dry food, viz. 2 oz. of grain and 2 oz. of meal, the latter weighed before wetting. A hen in full lay requires more food; a large Plymouth Rock eats more than a small Hamburgh; fowls running on a soil rich in worms and grubs do not require so much food as those kept in confined pens. The object in feeding is to keep the fowls in good condition without letting them grow too fat. Two meals a day are ample for birds at liberty.

The First Meal

The first meal, given early in the morning, should consist of soft food, say half middlings and half ground oats, or one-third some of the prepared foods and two-thirds a less expensive meal mixed with kitchen scraps or a little meat or fish meal. One of the meals should be moistened with hot water,

warm milk, or broth, and the other meal gradually stirred into it until the whole forms a crumbly, not sticky, mass. An alternative mixture may consist of equal parts of bran, middlings, Sussex ground oats, maize meal and fish meal, with some cooked vegetables added. If the ground be clean, dry, and hard, the food may be thrown down on to it, the place being changed every three or four days. In wet weather small wooden troughs or large flower-saucers can be used.

When feeding, scatter the food about. If troughs are used, let them be placed some distance from one another, and quickly fill each one in order to give every fowl an equal chance to get a fair meal. If the food is in one heap, the strong fare better than the weak, and give their companions many a jealous and damaging peck.

Second and Third Meal

The second meal should be given shortly before roosting time, and should consist of hard corn, scattered in grass in fine weather or in dry litter in wet weather. For fowls in confinement a third meal may be introduced without increasing the quantity of food supplied to them. The first meal should not be so liberal. A slight feed of hard corn can be given at midday, and a third feed on a little larger scale by way of supper. When kept in close quarters they are very much inclined to put on fat owing to want of exercise; by giving them a little food rather more frequently they are stimulated to move about. It is desirable to make them scratch for the corn.

Feed Regularly

The meals should be regular and punctual. Regularity of feeding means that they are fed every day, not forgotten one day and fed to repletion the next by way of amends for their enforced starvation. Some care should be taken to give the last feed well before sunset—in mid-winter perhaps as early as three o'clock—in order that there may be plenty of time to scratch for the corn and eat it and retire to roost before darkness sets in.

A good staple grain mixture consists of

1 part oats, 1 part wheat, and $\frac{1}{2}$ pt. kibbled maize—increasing the latter to 1 part in cold weather. Always use kibbled maize as it keeps the birds more active in search of it in the litter than does the whole grain. If the food has to be bought, the best should be purchased; it will be found very poor economy to buy cheap corn or meal. On a farm a great deal of food can be given to the fowls which it would be foolish to buy at any price, such as the screenings from the threshing-machine, sweepings from the barn or granary, potatoes, and other odds and ends.

Fowl-Houses and Pens

Considerable latitude is allowable in the plan of a poultry-house; indeed, a spare outhouse may easily be rendered suitable. If the house is built for the purpose, seasoned wood is as good material as any to use. Since it is an accepted axiom in poultry-keeping that small isolated groups yield more profit than one large flock, the house should not be designed too large. Neither must it be too small, or overcrowding is caused—one of the most fatal errors which can be made.

Proper Size of a Fowl-House.—A rough idea of the size of the house can be formed by calculating that each fowl requires 10 c. ft. of air space in a closed roosting house, or not less than 4 sq. ft. of floor space in an erection of the scratching shed type. Each bird needs from 6 to 8 in. of perch room.

Construction of Fowl-House.—The roof must be perfectly sound and water-tight; a leaky roof means a damp, cold house, two faults to be avoided. There must be adequate means of ventilation. Fowls roosting in a badly-ventilated house breathe a vitiated atmosphere, which soon produces disease. The house should be light; its occupants should be able to see their way to walk about in it and to find corn scattered in the litter. The best and cheapest floor is made of consolidated gravel and ashes, made level and floated with boiling tar, with sand sprinkled over. Amateurs should purchase their fowl-house ready-made from one of

the reputable dealers. These mostly have wooden floors. In the long run, this course is frequently the cheapest and most satisfactory.

Perches.—The perches, raised not more than 2 ft. 9 in. from the ground, should rest in sockets, and have a dropping board 9 in. below. Each should be the same distance from the floor. If one is higher than the next,

one side of the house, build an end to the extension and roof it over, leaving the front open save for a weather-board top and bottom, as shown in fig. 80. The sunny side of the house should be selected for this shed. If desired, a light wooden frame covered with wire-netting can be fitted to the front, so that the fowls can be shut up in very bad weather. The open

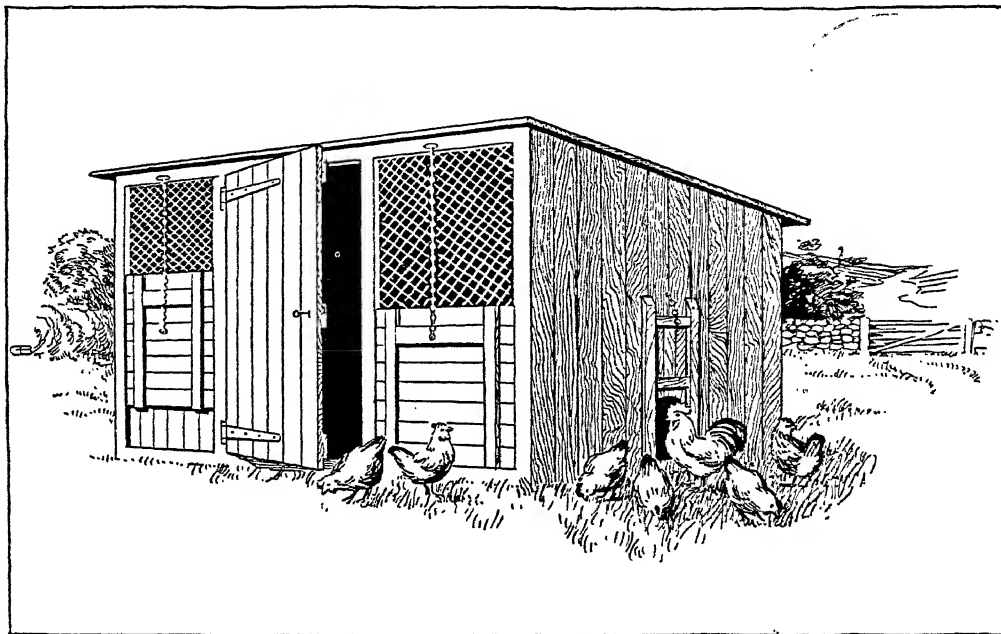


Fig. 80.—Poultry Pen.

and a third still higher, the topmost perches will be crowded to excess and the lower one unused.

Nest-Boxes.—The nest-boxes should be roomy, not less than 16 in. square, and they would be better 18 in. deep by 16 in. high and wide. Convenient nests may be made by a few bricks arranged on the floor in each corner of the house, and darkened by a board leant over them to the wall.

Fowl-Shelter

Unless the house has a scratching floor, a shed is very necessary to shelter the fowls by day. One of the best plans is to extend

shed, by being light, and dry underfoot, provides just what the fowls seek. These requirements are absent when the shelter is provided by raising the floor of the house some 2 ft. from the ground, although this dismal, dirty refuge is better than none at all. The floor of the shed should be bedded with wheat-straw, chalk, cavings, or dry bracken and leaves, about a foot deep, which should often be raked over and renewed as occasion may require.

Fowl-Runs

Runs or pens are made by driving posts about 6 ft. apart into the ground, nailing

thin boards to them for the first 2 or 3 ft., and attaching wire-netting for the next 4 or 5 ft. as the case may be, to form a fence 6 ft. high. The posts should be stout ones; three 9-in. planks will make the boarded part of the run, and a 2- or 2½-in. mesh, not larger, is a good size for the netting. A fence 6 ft. high or thereabouts will confine most fowls. Good portable runs can be purchased from dealers at moderate prices.

will carry about 100 fowls per acre. If divided into two runs for alternate use 20 sq. yards per bird will suffice. On an earth run, kept dug and limed, 20 sq. ft. each should be allowed; and in a covered backyard run, 10 sq. ft. per bird.

Management of Fowl-Run

There are two points, which may be considered under this heading, of paramount

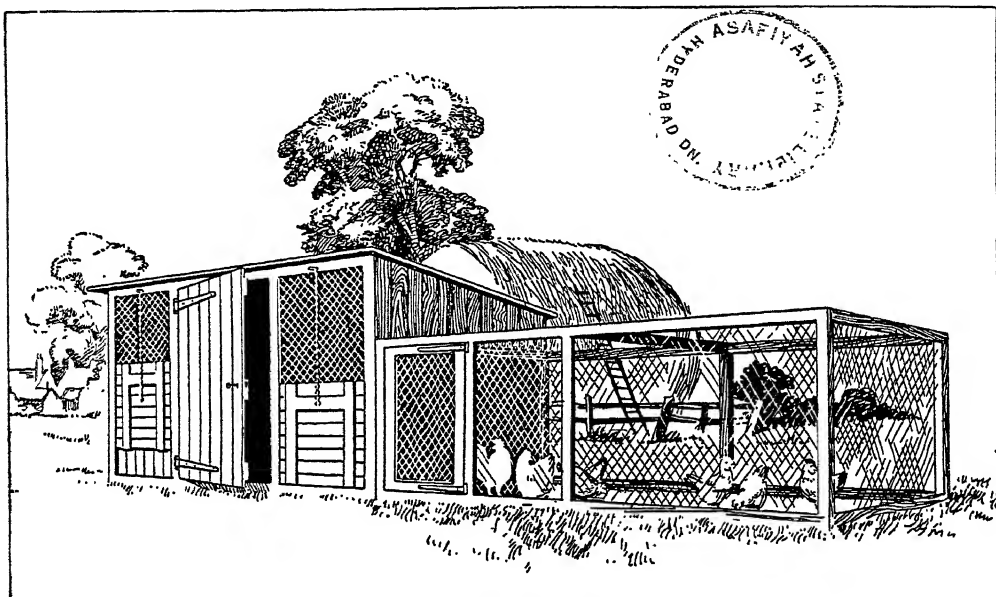


Fig. 81.—Poultry Pen and Open Run

They may be readily transferred from place to place.

Grass-Runs

It will be a great advantage if the enclosed fence be so large that the grass will be always growing. Fowls can certainly be kept in a very much smaller space, but the smaller the space the more skill and attention is required to keep them healthy. The most may be made of a small piece of grass by planning the houses and runs round it, and arranging for the fowls from each run to have access to it for an hour or two a day. Long grass is useless to fowls; still worse, it is often dangerous. Grass in permanent use

importance if success is to attend poultry-keeping; they are dryness and cleanliness. Fowls should be as dry as possible overhead and underfoot, hence the importance of a good roof to house and shed. On a small run the continual movement and scratching of the fowls soon reduces the level below the surrounding land; consequently in wet weather the fowls are knee-deep in sludge, and in a most uncomfortable condition. This may be avoided by attention to drainage, and by keeping the run at a higher level than the surrounding land. The health and laying of the stock will well repay this trouble. The little word "dry" should never be absent from the thoughts of the poultry-keeper.

Unless cleanliness also is properly and regularly attended to, it is better to leave poultry-keeping alone. The outside of house and shed should be painted every year, or brushed with tar; the inside should be lime-washed (with a strong solution of carbolic acid in the wash) two or three times a year. Creosote is also suitable. A dropping board should be placed under the perches and sprinkled with sand or dry earth, and cleaned daily; this keeps the manure out of the litter.

Insect Pests

Cleanliness in the house is one step to securing cleanliness of the stock. The poultry-keeper must be continually waging war against insect pests. He who keeps his fowls the cleanest will have the most eggs, the strongest chickens, and the least sickness. There are three chief pests, with numerous sub-varieties, viz. the flea, the louse, and the mite. *Fleas* generally live in the nests and consequently often induce hens to lay astray. It is well to remember that these insects breed in dust. The reason why the dust-boxes should be movable is that they can be taken from the house every now and then and thoroughly cleansed.

The *louse* lives on the fowls; crowds of round, yellowy-brown lice are often found running about the fluff and skin just under the tail. Periodically each bird should be

examined, and if lice are found it should be dusted at roosting-time with insect-powder or flowers of sulphur (powdered brimstone). It should be turned on its back and the powder dredged into the roots of the feathers beneath the tail, between the thighs, under the wings, and then at the back of the neck.

Treatment for Infected Fowls

Mites live on the perches, from which they crawl on to the fowls to irritate and weaken them by sucking their blood. In addition to regular dustings with insect powder, badly infested fowls may have the affected parts—bare patches—treated with an ointment of 1 part oil of caraway and 5 parts white vaseline; this is less irritating than most other preparations. About once a month all perches should be taken out of the house, rubbed over with paraffin, and replaced when dry. Half paraffin and half creosote is excellent. Fowls naturally attempt to rid themselves of insects by scratching earth into their feathers and shaking it out. Therefore in every pen there should be a large box slightly sunk into the ground, and full of dry earth, with some kind of lean-to cover. Fowls penned up are more troubled by insects than those which have liberty. Add some pyrethrum powder to the dusting material, and sprinkle some regularly in the nest boxes.

CHICKEN REARING

Nest for Hatching

To ensure a good hatch the nest of the sitting hen must be protected from intrusion by other fowls. Therefore it is best to set apart a small house, or any unused shed, or even a large pen, for her sole use. If only the fowl-house is available, a piece of netting should be tacked in front of her box, from which the hen will have to be removed daily for a feed and drink; when she returns to her eggs the wire-netting must again be secured. A nest box should measure at least 16 in. every way.

The foundation of the nest should be earth. A large bucketful may be put in a box, or in a corner if kept in position by bricks. The heap should be slightly hollowed in the middle, dusted over with flour of sulphur, and bedded with soft short hay. A hen should never be placed in an old nest. It may be advisable to give her some pot eggs at first until it is quite certain that she will sit.

Eggs for Hatching

The eggs should be fresh, and laid about the same date. Freshly-laid eggs will begin

to chip about the twentieth day of incubation; old ones may require twenty-two days. Consequently, if there be much discrepancy in the age of the eggs, the hen may lead her first hatched chickens from the nest, leaving those still in the unhatched eggs to perish.

There is no means of ascertaining the sex of the future chicken. Early in the season the long-pointed eggs may yield more cockerels than pullets, but by no means must it be taken as a certainty that such will be the case.

In winter, nine or ten eggs are sufficient for each hen; later, eleven or twelve may be given, and thirteen should always be the maximum. Taking one season with another the proportion of chickens reared by hens entrusted with ten or eleven eggs will be larger than if fifteen or sixteen are given to them.

To Test the Fertility of Eggs

The condition of the egg on the seventh or eighth day of incubation can (and should) be ascertained with the help of the simple egg-tester. If an egg be supported against the hole in the tester and held between the eye and a lighted candle in the dark, it will appear nearly transparent if unfertile, but nearly opaque if fertile. If the examiner has

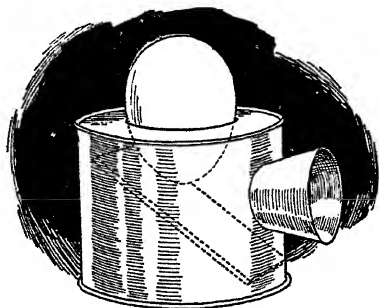


Fig. 82 —Egg-tester

no experience in testing eggs a new-laid one should first be examined, then all those which present the same appearance after eight days of incubation may be rejected. With the assistance of the egg-testing lantern, the germ can be detected by experts after

forty-eight hours' incubation, and is plainly visible on the fourth day.

When two hens are set at the same time it often happens that between the two only sufficient fertile eggs are found to make up one nest; all these should be put under one hen, and the other started afresh on a second lot of eggs. With the exception of the one examination at feeding-time, the less sitting hens are disturbed the better.

Hen-Coops

The coop should be dry, airy, and afford protection against every change in the weather; it should also be so made that access can easily be obtained to every part of the inside for the purpose of white-washing after each brood leaves it. Coops are generally made of wood about 2 ft. each way, or 2 ft. deep and 3 ft. long; the roof slopes, with a good fall, to the back; the back and ends are boarded up. One half the front can be boarded up and may form the door; the remaining half may be lath work, or covered with a netting.

A shutter should be provided for the open part, held in place by buttons, and fitting closely in every part except 6 in. from the top. By this means the chickens can be safely secured at night, yet always enjoy plenty of air. The bottom should be raised an inch or two from the ground, and always kept thickly covered with fine dry soil or sand, or a mixture of both. Early in the morning all dirt should be removed, and a little fresh soil added.

Best Position for Coop

The coop should be placed out of doors where the chickens can run about on short fine grass. Chickens should not be reared on the same spot two years in succession. If the coop has to stand where it can be approached by other poultry, a small yard should be made for it. Construct two sides 4 to 6 ft. long and $1\frac{1}{2}$ to 2 ft. high, and one end the same height and the width of the front, or the open part of the coop; all these can easily be made out of strips of $\frac{1}{2}$ -in. wood 4 to 6 in. wide nailed together to form the frame and covered with netting.

A fourth piece will be required to form the top. The four pieces can be lashed together by string or wire, and when placed in front of the coop will provide a light movable yard.

The coop and yard must be moved every day to fresh ground. Two pieces of thin board 7 or 8 in. square are required for feeding purposes, and an ordinary 8-in. flower-saucer with a pot two sizes less inverted in it. The latter makes an excellent drinking fountain, easy to empty or fill and keep clean, and, moreover, one which, by reason of the inverted pot, the chickens do not scramble into or the hen upset.

Management of Young Chickens

On the evening of the day on which the eggs are due to hatch, the hen may be gently lifted from her eggs, any empty shells removed, and a cursory examination made to ascertain if any have slipped over the unhatched eggs; if so they should be pulled off or the chickens in the eggs will be suffocated. For at least twenty-four hours after hatching, leave hen and chickens to perfect quiet. The chickens require no food and are better without it. Their first meal should be an egg beaten up with two table-spoonfuls of milk and baked into a kind of custard. To this add a pinch or two of ground oats, coarse oatmeal, or some prepared chicken-meal, allow to stand for ten minutes after being merely moistened by boiling water, and mix together. Give the hen a hearty meal of Indian corn and take her with the chickens to her coop. Scatter a little of the egg-food on one of the boards, and in a very few minutes some of the chickens will begin to pick it.

Diet for Young Chickens

When the hen has settled down and is brooding her flock, take away the feeding-board, and clean off every particle of food. Sour or fermented food will most likely

set up diarrhœa and bowel complaints amongst the chickens. On the third day the egg may be omitted, the diet consisting of the prepared chicken-meal, moistened as before, but made a little wetter, and then dried up again into a crumbly (not sticky) mass by adding oatmeal, ground oats, or middlings. Sloppy food, such as bread soaked in water, is bad for chickens; bread soaked in milk and dried up again, by adding some dry meal or other, makes, on the contrary, a good food. The next addition will be some small, hard grain, a few grits; a little canary or millet seed should be given in place of one of the soft feeds.

There are many mixed dry chick feeds on the market which are very suitable for use in conjunction with the soft food. By the end of the week the hen will have taught the chickens to eat small wheat, and then this capital bone-forming grain must gradually be given more freely and the soft food less liberally. For about three weeks chickens should be fed every two hours, a very little at a time, the grain thrown amongst the short grass or on the ground,

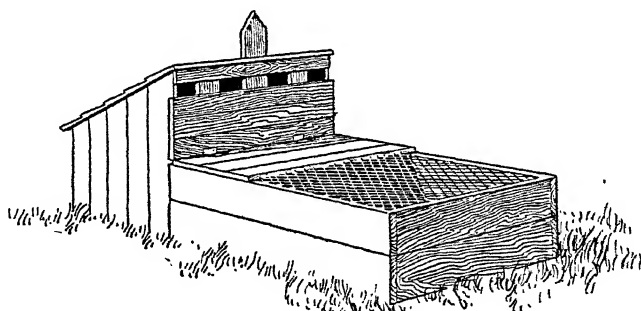


Fig. 83.—Chicken Coop

the soft food put on the little boards or in saucers; but every vessel from which soft food is fed should be duplicated, so that one may be perfectly cleansed while the other is in use. A very little finely chopped up raw meat or, better still, prepared granulated meat, should be allowed every other day after the first fortnight. The water-fountains and saucers should be emptied every night and filled with fresh water in the morning;

in hot weather the water should be changed once or twice a day and shaded from the sun.

Cleanliness

Chickens suffer even more from insects than adult fowls; until this fact became known thousands of chickens were physicked to death, whereas slight attention to cleanliness would have worked a certain cure. If

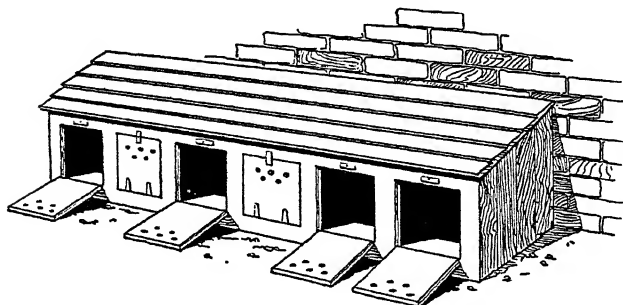


Fig. 84.—Range of Hatching Boxes

chickens from three to six weeks do not seem to come on, if they feather slowly, if their feathers look dull and loose, if they are thin when handled, the presence of insects may be suspected.

Gapes in Chickens

A fatal disease sometimes attacks chickens, when a few weeks old, known as the "gapes". The chicken incessantly stretches out its neck and opens its mouth as if gasping for air; and this is really the case, for its windpipe is blocked with a cluster of minute worms. The disease can only be caused by the birds picking up the worm or ova, so that directly there is an outbreak the chickens should be treated and removed to high and dry ground, the worms mostly developing in moist situations.

To treat the sufferers strip a feather of all its web except for a small tuft at the end. Dip this in turpentine and gently and carefully insert it inside the windpipe, withdrawing with a turning movement. This will bring away the worms, which must be carefully destroyed. Add to each quart of drinking water three drams of salicylate of

soda. Bury all birds that die, and dress tainted ground with air-slaked lime, putting no chickens on the place for several seasons.

Management of Older Chickens

As the chickens grow, the hen may be given her liberty, when she will find a quantity of natural food for them—the best they can have. Leave the hen with her chickens until she begins to drive them from her. For some time longer the chickens can roost in their coop until they show signs of wishing to perch, when they should be provided with a well-ventilated house and low perches. If at this period they are crowded at night, or if the roosting-place is too warm and badly ventilated, all the trouble expended on them will be wasted. Their food should consist of a breakfast of soft

food comprising middlings, Sussex ground oats, maize meal, and a sprinkle of meat meal; and a grain mixture of kibbled wheat and maize, with a small proportion of groats—afterwards changing to whole oats. Give tender fresh green stuff regularly.

A Feeding Pen

A feeding-pen is very useful when they have to feed with grown-up fowls. Such a pen can be made by tying together hurdles or frames similar to those used in the construction of a yard to a coop, save that they have openings in the middle wide enough for a chicken to pass through, but too small to admit a larger fowl. The size of the openings can be increased or diminished if a row of staples be driven into the top and bottom of the frames, through which stout iron wires are inserted, to be removed as occasion may require. In such a pen chickens can be fed as often as required and quite apart from other stock, and by manipulating the iron rods all but quite small chickens may be excluded. The pen should be moved to fresh ground every day or two.

As soon as the cockerels begin to crow they should be kept separate from the pullets. Cockerels reared together will agree perfectly well, even when grown up, if no fowl of the opposite sex intrude upon them, but if one of these cockerels be taken away for only a few days he must not be put again amongst his old companions, or he will probably be killed or seriously injured by them.

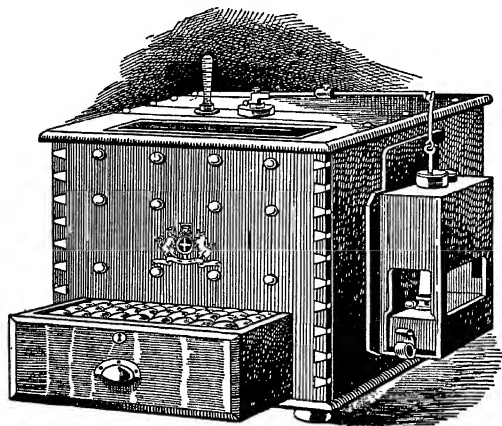


Fig. 85.—Chicken Incubator for 50 Eggs
(C. Hearson & Son, Ltd., London)

Artificial Hatching and Rearing

Chickens may be hatched and reared all the year round in an incubator, quite independently of any broody hen. The general arrangement of the interior of an incubator of the hot-water tank type will be seen by referring to the illustration of one of Hearson's machines (fig. 86). As the method of working differs with the machine, the best advice to give is to follow the maker's instructions, but a few general observations may help. The incubator should be worked in an even temperature of 50° to 60° F.; the air of the room should be as fresh as possible, and not too damp; a dry, airy cellar is not a bad place, a greenhouse is a very bad place. The 50- or 60-egg size machine or the 100-egg size are the best. In the smaller machines the heat is not so regular; in the larger it is more evenly distributed over the eggs.

Run the machine two or three days before putting any eggs into it. The eggs should be very fresh; five or six days old should be the limit, and they should come from strong, healthy, vigorous stock. There is also a hot-air type of incubator which some prefer, but whilst both types have advantages and disadvantages there is practically no difference in the results if both are managed properly. Before making a choice,

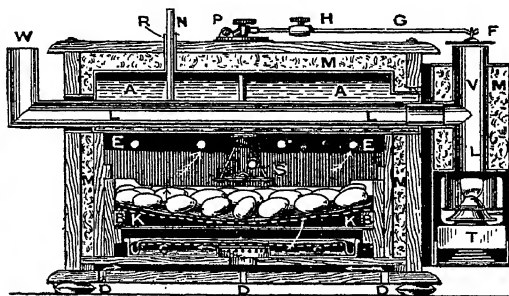


Fig. 86.—Section of Hearson's Incubator

AA, Tank of water. BB, Movable egg-tray. CC, Water-tray. DDD, Holes for fresh air. EE, Ventilating holes. F, Damper. G, Lever. H, Lead weight. KK, Slips of wood. LLL, Lamp chimney and flue-pipe. MMM, Non-conducting material. N, Tank thermometer. O, Needle for communicating expansion of capsule s to lever G. P, Milled screw. R, Filling tube. S, Thermostatic capsule. T, Petroleum lamp. V, Chimney for carrying away surplus heat. W, Chimney for discharge of residual products of combustion.

the two types should be compared with a view to selecting the most convenient for the individual purpose.

Management of Incubators

To work a machine to the best advantage, fill the drawer with eggs and hatch out as many as possible before introducing any fresh ones; it is a bad plan to put a few fresh eggs into the drawer every day. Examine the eggs on the seventh day, and remove all the clear ones; but do not fill up their place with fresh ones if you want the best results. Keep the temperature in the drawer at 102° to 103° F. for the first ten days, and between 103° and 104° F. for the second ten days. Be careful that the bulb of the thermometer in the drawer does not touch an egg. Be sure the thermometer is accurate and in perfect order. Air the

eggs twice in twenty-four hours; one of these airings may continue from five to fifteen minutes, according to the natural temperature, the other may be much shorter.

While airing the eggs turn them half round, thus completely turning them once in twenty-four hours. When the eggs begin

if they huddle together in the hot part and make a piteous chirping, more heat is required; if they scatter themselves and stretch themselves on the floor and make a contented chirp, the heat is right and comfortable; if they come to the entrance and pant and breathe fast and drink freely, the heat is excessive.

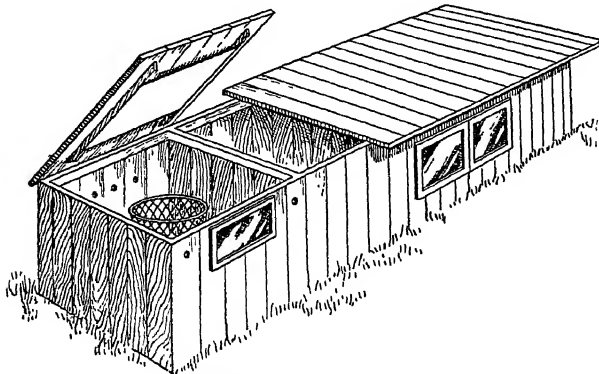


Fig. 87.—Foster Mother

to chip be careful the chipping places are uppermost, and put back the drawer in the machine at once. If many chickens die in the shell, and if they seem to be very wet, in future somewhat reduce the supply of moisture. The proper regulation of the moisture is one among several problems of incubation that await further investigation and solution. When the eggs are hatching do not open the drawer more than necessary.

Management of Rearers

The rearer should be heated at least a day before any chickens are expected; it should be set up and worked according to the maker's instructions. In winter the temperature of the hottest part should be about 90° F. for newly-hatched chickens; this may be kept up for three or four days and then gradually reduced. The best guide as to the proper heat is the behaviour of the chickens;

if they huddle together in the hot part and make a piteous chirping, more heat is required; if they scatter themselves and stretch themselves on the floor and make a contented chirp, the heat is right and comfortable; if they come to the entrance and pant and breathe fast and drink freely, the heat is excessive.

Plenty of Exercise

The feeding and management of chickens in rearers will be the same as when they are with a hen. The chief thing to remember is to give them all the exercise possible; let them run about a field just as if they were cooped up with a hen; by no means coddle them, and never overcrowd them. The great advantage of a rearer is that the chickens can go into the warm chamber whenever they wish, and if they have liberty, they

will be running in and out all day. Small parties of chickens do best in rearers: twenty to thirty, never more; two rearers, each holding twenty chickens, will give better results than one holding fifty. Newly-hatched chickens should not be put into a rearer which already contains chickens a week or ten days old. Among the small types of rearing appliances there are various designs of the removable stove or lamp and hover, which may be placed in any suitable shed or an ordinary field poultry-house.

Chickens are often of necessity reared artificially from November to February or the middle of March, depending on the weather; but broody hens should be utilized whenever available. If two or three eggs are transferred on the nineteenth day from the incubator to a broody hen, and she is allowed to hatch out the chickens, no difficulty will be experienced in making her take to as many as may be deemed advisable.

DISEASES OF POULTRY

Prevention by Care

Diseases should be rare in a well-managed yard. The more common are contagious and infectious; therefore, as soon as a fowl is out of health, it should be isolated from its companions, or killed and buried. But it may be useful to describe shortly the symptoms of the most common ailments.

Liver Disease.—This is almost incurable and very contagious, and when rampant on a run will hang about the place for months, and although all the old stock be cleared off, new and healthy stock soon become affected. The fowls lose their appetite, mope about all day with ruffled feathers, their faces become pinched, the combs shrink up, and the bright healthy red of both turns a dull purple, the evacuations are liquid and frothy, the victims grow very thin and light, and eventually die. To avoid it, do not over-feed or use forcing foods, and always give plenty of green stuff.

Roup.—If the nostrils are moist, if the breath smells disagreeably, and if yellow cheesy growths are seen in the mouth and throat, the fowl should be killed and burnt immediately. If it is determined to try a cure for the yellowish growths, an application of caustic to the spots, with liberal doses of Epsom salts, say half a teaspoonful per bird, dissolved and mixed in the soft food, may be serviceable. If there is discharge from the mouth and nostrils apply a warm solution of permanganate of potash twice daily. Roup, with its variations, is very contagious and difficult to remove from a yard if it once gets firm hold, which it is the more likely to do the longer a roup-y fowl is kept.

Egg-Binding.—When a hen cannot pass her egg she will be uneasy and restless, straddle as she walks, with tail slightly depressed, and will often in vain go to her nest. By careful manipulation the egg can be detected, also the heat in the surrounding parts. Apply oil to the vent, and hold the part over steam arising from a jug of boiling water. This serves to relax the organs and

often enables the bird to pass her egg successfully. Note that breaking the egg from without is certain death to the fowl.

Scaly Leg.—This is a growth on the legs and feet caused by a minute insect under the scales. To prevent the trouble, rub the legs three or four times a year with a paraffin rag. To effect a cure, wash the legs with warm water and soft soap, and scrub off all the crusty growth possible. Then apply an ointment of 1 part oil of caraway and 5 parts white vaseline. The disease is contagious.

Shell-less Eggs.—Eggs without shells are caused (1) by feeding on nostrums and spices to increase egg production; (2) by the fowl being too fat and lacking exercise; (3) by a sudden fright or by being chased about; and (4) by a want of lime to produce the shell material. The obvious remedy for (1) is to discontinue the spices, and for (4) to provide lime. A course of Epsom salts, as much as will cover a penny, put into every pint of drinking water—until there is evidence that the medicine is working—and a reduction in the quantity of food, will restore the organs to their normal state.

Crop-Binding.—A hard and swollen condition caused by the presence of stringy grass or other blocking material. Pour some castor-oil into the crop and knead it to loosen the contents. If this does no good, cut the crop open with a sharp penknife, remove the contents, wash out with a disinfectant, and sew up. Be careful to sew the two skins separately, and to dress with an antiseptic ointment.

Bumble Foot.—A swelling due to a high perch and a hard floor, or to treading on some sharp substance. Open the abscess, remove the pus and core, wash with an antiseptic, apply a good ointment, and bandage. Keep in a coop until cured.

Feather Plucking.—Generally caused by parasite infestation. To avoid such pests as insects or mites, use pyrethrum powder freely, dusting the birds down to the roots of the feathers periodically.

FARM POULTRY

Profitable Occupation

Unlimited space and variety of foods make a farm an ideal place for keeping poultry. There is no doubt, too, that the occupation will be profitable if the owner gives the same attention to the housing, breeding, feeding, and rearing as he does to other stock. The fowls should be scattered all over the farm in small flocks of twenty or thirty of the same breed, and the choicest and most productive specimens should be selected to breed from. For convenience the chickens can be reared near home or by cottagers on the estate until they are old enough to take care of themselves, when they can be drafted into the fields. Probably egg production will be found the most profitable branch, especially if the holding is within easy reach of a large town to which the produce can be sent twice or thrice a week in large consignments for sale by the better-class shopkeepers.

Fattening Poultry

Breeding and rearing chickens for the fatteners pays very well near the large fattening centres; money is slower in coming in, but the amount is larger when it does come, and fatteners complain that they cannot get a sufficient supply of the right kind of chickens for their purpose. Rearing chickens for killing, without artificial feeding, for ordinary markets is only profitable if the market can be caught at its best, that is March to July.

Turkeys.—There are no birds more profitable to breeders than turkeys. They require open sheds, high perches, and a good stretch of land to wander in. With this they half keep themselves. The varieties are black, white, bronze, and buff. The summer turkeys like roosting in trees, but sheltered roosts must be supplied for them in winter. The hens are ingenious in finding secret places to lay in, but their peculiar cry betrays them. They are splendid sitters. The time of sitting varies from twenty-seven to thirty-

one days. For the chicks a good supply of water in shallow saucers is necessary, and an excellent food consists of boiled nettles, hard-boiled eggs, a little parsley curd, and a few bread crumbs all chopped together and made into a paste. This is given when the chicks are newly hatched.

Geese.—These birds may be kept profitably and without much trouble where there is access to common land or rough grazing. Geese begin to lay in February, and the goslings may be killed off the grass and sold as "green geese" as the broods succeed one another. This entails less hand feeding than when they are run on for Michaelmas or Christmas, for which season the demand is much less than formerly.

Ducks.—Ducks are profitable for breeding table ducklings for the early season trade, for which the Aylesbury breed is the best. For egg production on a free range Khaki Campbells or Indian Runners are capable of remarkable prolificness, and the cost of feeding is relatively small during the open months of the year.

Bantams.—In the Plate one of these diminutive fowls is shown, and although these birds, of which there are many varieties, are of no practical importance, a word may be added as to their distinctive qualities. Bantams become very tame and consequently make nice pets. Many of the varieties are very charming in appearance, while all are notable for their erect carriage and general pertness. There are pure white bantams, black bantams, like tiny black Hamburgs; Game bantams, resembling Game fowl in their points; Sebright bantams, exquisite in plumage, not to mention many others. Apart, however, from their beauty, bantams will in no way repay the trouble which must be expended upon them. Their eggs are very small, while as table fowl they are, of course, of no account. Moreover, they are very delicate, and to breed bantams successfully is a very difficult matter. See Plate facing p. 96.

POULTRY FARMING

Prospects of Poultry Farming

It is only within quite recent years that poultry farming as such can be said to be a profitable undertaking, and it is only now possible to make a reasonable margin where there is very considerable skill and experience backed by adequate capital. The prosperity of many well established commercial egg producers in the years following the war was greatly helped by abnormal economic conditions, and it would be very unwise for beginners to think that all will be plain sailing in the future. Nevertheless, the position is vastly more hopeful than it was formerly, and this is due to the great advance that has been made in the science and practice of breeding egg-laying strains, to the much greater knowledge of foods and feeding, and to the introduction of labour-saving devices and methods. If to this progress could be added a more general co-operation for marketing, the business would rest on a much firmer foundation.

Income from Layers

To qualify for such work the training should include a period on a farm where egg production is carried on commercially, as well as attendance at an agricultural college or recognized training centre where the subject is properly dealt with. To this must be added a capital of not less than £1000, and maintenance for a couple of years whilst the business is being put on a paying basis. Much may, however, be done on the general farm or on the paddock attached to a country-house, treating the poultry as a side-line or a hobby that is expected to bring an appreciable return. The houses may be built by the occupier, and a good proportion of the food produced on the place, whilst no paid labour need be employed.

In any case birds of good strain only should be kept, and the records of laying tests show how widely strains may differ in respect to prolificness. A high average

flock yield can only be attained and maintained by constant careful selection for breeding. A pen of average birds may yield, say, 120 eggs each annually; but a pen of a selected strain may give an average per bird of, say, 170 or 180 eggs. Profit depends upon the elimination of the poor layer, plus the reduction of the costs of production.

Eggs should be collected twice daily—a sadly-neglected rule in many poultry-yards, leading to the sale of stale eggs at top prices, and the consequent falling off in custom.

Chickens for the Table

The other possible line of profitable production is the rearing and fattening of table chickens. The centre of this industry is in East Sussex. As a rule farmers and cottagers rear the birds, and the fatteners collect them at an age of three or four months. They are then subjected to a fattening process over a period of about three weeks, being sold at the highest prices on the London market under the trade description of "Surrey Fowls". The highest prices are paid in the spring; but over the year the average profit is usually sufficiently remunerative. The same method, with necessary modifications, may very well be adopted elsewhere, provided there is an assured market for such produce, and that suitable birds and feeding stuffs are available, with relatively cheap means of transit.

Preparing Poultry for the Table

When fowls are to be fattened for home consumption, ten or fourteen days' confinement and plenty of soft food, twice a day, will add to their weight; but for marketing purposes the fattening process is prolonged in this manner. The birds are put into a clean lime-washed pen, placed where the light is dim, for the more quiet they are kept the more flesh they produce. For ten days ground oats mixed with skim-milk and enriched with beef or mutton fat, forms the staple food, twice a day. During

the next ten days the crammer is used. It is indispensable if fat chicks are required, as the birds lose their appetite after having been penned up about a fortnight. No stale food must be left about, and if the pen floor is not made of laths which allow the droppings to fall through, it must be cleaned out with very great care.

The birds must be plucked while still warm, to prevent tearing the breast skin. For market it is usual to press until cold, as this increases the plump appearance. Careful singeing is a matter of importance.

The word "higgler" is in common use in Sussex. It means the man who buys from the rearer and sells to the fattener at a profit.

Useful Organizations

The chief organizations are the National Utility Poultry Society, 3 Vincent Square, Westminster, S.W.1, and the Poultry Club, 3 Ludgate Broadway, London, E.C.4. The *Year Books* of both give lists of the Specialist

and local Clubs. Training in poultry subjects is given at several agricultural colleges and farm institutes, and most of the county authorities appoint an instructor for their area. Information on all such points may be obtained from the Small Live Stock Office, Ministry of Agriculture, Whitehall Place, London, S.W.1, or from the Secretary of the Agricultural Education Committee at the various County Council head-quarters.

Publications

Poultry Husbandry, by Edward Brown (Edward Arnold); *The Poultry Manual*, by the Rev. T. W. Sturges (Macdonald & Evans); *Commercial Poultry Farming*, by T. W. Toovey (Crosby, Lockwood, & Son); *Commercial Egg Farming*, by S. G. Hanson (Constable & Co., Ltd.); *Utility Ducks and Geese*, by J. W. Hurst (Constable & Co., Ltd.); *The Daily Mail Poultry Book*, by Tom Barron and J. N. Leigh (Associated Newspapers, Ltd.).

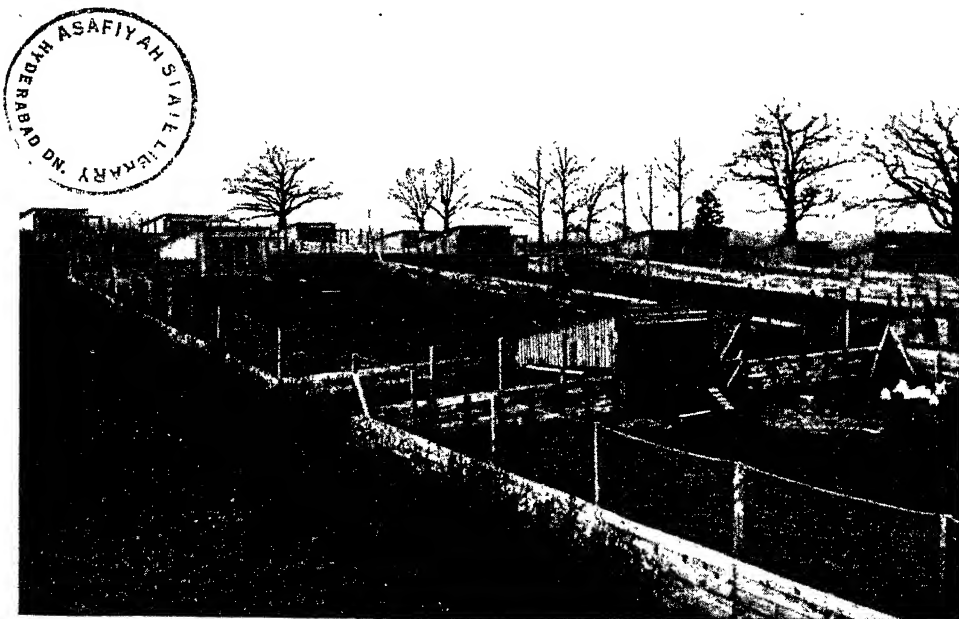


Fig. 88.—General View of Breeding Pens, Homestall Poultry Farm, East Grimstead, Sussex

BEE-KEEPING

To Supplement Income

Few employments lend themselves more readily to home management than bee-keeping. The care of an apiary is well within the scope of a woman's work, the labour being light; but careful attention to detail and constant supervision are essential to success.

At the same time, to pretend that large and certain incomes can be made by bee-culture would be absurd; the variable climate of the British Isles has to be reckoned with, and a cold late spring or wet summer causes a sad deficit in the honey yield. Still, taking one year with another, and considering that the initial outlay is but small, and that the stock increases rapidly, bee-farming may be recommended as a means of adding to small incomes.

Average Yield

In a really favourable season the profits may be considerable. Chivers & Sons took as much as 11½ tons from 56 hives one year. In a later year they averaged 183 lb. per hive. Two hives of Dutch bees yielded 854 lb., which, at 6d. a pound, realized £21, 7s. Perhaps a fair average, one year with another, would be 50 lb. per hive; current prices, 1s. to 1s. 3d. a pound.

Honey is in universal demand as a food, and a local market is rarely lacking for first-class honey, carefully put up in attractive sections, or run into clear glass bottles. In large towns tradespeople readily purchase it, if they are satisfied that the quality is good and the price reasonable. Beeswax, again, is easily sold, and many chemists will deal in honey, if the latter is of fine quality and thoroughly ripe before extraction. It is also an accepted fact, that for the orchard, bees are valuable fertilizing agents, and the difference in the fruit harvest is very perceptible where the blossoms lack the visits of these tiny, fairy brownies.

How to Start Bee-Keeping

To commence bee-keeping under the best

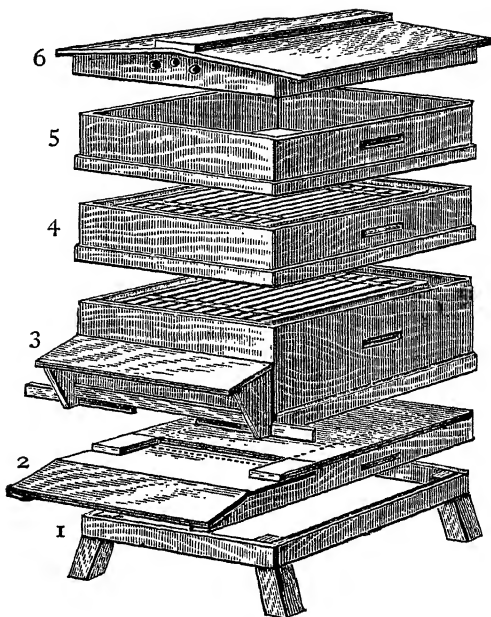


Fig. 89.—Hive with the Parts separated

conditions, swarms should be ordered early in the year, but the most satisfactory way of starting is to purchase hive and bees complete. Two, or at most three, hives are enough for a beginner to start with. Dutch bees are the most satisfactory, because they are seldom susceptible to the deadly Isle of Wight disease, which has exterminated apiaries wholesale. Many experts prefer the British bees, which are now largely crossed with Italian or Carniolan queens.

The Hive

Straw skeps have been superseded by the scientific wooden hive with movable frames in which the combs are built, and which may be lifted out for inspection when necessary with but little disturbance to the bees. Fig. 89 illustrates a well-known hive of modern type, with the several parts raised in order to show the construction of each, as enumerated: (1) stand; (2) floor-board; (3) outer case, with body-box or brood-chamber

within; (4) surplus-chamber, with frames for extracting; (5) "lift" for raising roof when sections of honey are being filled; (6) roof.

Purchasing Stock

Should a honey-crop be desired the first year, a stock of bees should be purchased from a reliable dealer, on frames of comb containing brood and food. A stock so purchased in April may be readily transferred to the hive (fig. 8g) if on frames of "standard" size; and if stimulated by judicious feeding a good start may be made with the expectation of getting surplus honey or, if preferred, a couple of swarms before July. Care, however, must be taken to purchase only from a trustworthy man, as the dread bee-disease known as foul brood is most infectious.

Best Aspect

The right aspect for bees is a question often disputed, but south-east is favoured by most. A quiet, sheltered spot is most suitable, with a free flight for the bees in front, and room in rear of the hives for all bee-work to be done, because the bees resent anyone standing in their direct line of flight. On no account should hives be moved—even a few yards—to new stands in the same garden, or the bees will fly back to the old location and be lost. They should therefore remain in one spot throughout the whole season. They should not be under trees, and the sun should fall on them for at least part of the day, preferably not in the early morning, as it encourages them to start out too soon, so that many perish on cold spring mornings.

Proper Care

Water is a necessity, and should there be no running stream near the apiary, a constant pure supply must be kept in shallow pans, with crossed straws or pebbles to prevent drowning. Though there are many drinking fountains and other appliances which can be purchased, the bee-keeper, when commencing, will do well to expend more money in good hives and healthy stocks than in a multitude of appurtenances. When the site for the apiary is being finally decided upon, bear in mind that proximity to fruit orchards

or heath-clad moorlands is of great advantage, the former yielding early, and the latter late, crops of honey. But the main sources of supply come from such field-crops as white clover, sainfoin, mustard, and rape, and also from lime trees.

For spring, a few early garden-flowers may be grown near the hives, such as crocus, *Limnanthes Douglasii*, wallflower, mignonette, borage, &c. These yield pollen in early springtime, which is such a necessity, as forming the nitrogenous portion of their food, that it must be supplied to the bees artificially in the form of pea flour should crocus, willow, furze, and other early blossoms fail. Sprinkle the flour on chopped straw in damp-proof boxes.

The Management of a Swarm

Given a dry warm summer, the bees will begin to prepare for swarming from a healthy stock-hive in May, and sometimes hang out in thick clusters for several days before the old queen leads out her train, leaving the young one to reign in her stead. The old-fashioned clapping of tongs and drumming on tin pails when the swarm issues from the hive is now considered wasted energy, and smearing the new hives with sugar, beer, and treacle is also a custom of past days and quite unnecessary labour.

When the swarm at length issues, and the bees settle on the branch or bush chosen by their queen, put the new hive (with its frames fitted with comb foundation before hand) in the position which it is to occupy permanently; then, taking a clean skep in one hand, give the bough a vigorous shake, and the swarm will drop into the receptacle. The skep is then turned over on to a board—or a table-cloth laid on the ground—and propped up on one side. In a short time, if the queen is safe in the hiving-skep, all the flying bees will rejoin her. When they have collected again around the queen, place the skep near the new hive, and towards sunset proceed as follows.

Making an Entrance

Put in front of the new hive a table or stand of the same height as that on which

the hive rests; see that the floor-board is perfectly level or the combs will be built crooked; and rest one edge of it on the alighting board. Prop up the front of the hive an inch or so with pieces of wood, to afford free entrance to the bees. Lift up the swarm gently, and throw the bees out with a jerk, on to the table close to the hive-front; then, with a spoon, guide a few bees to the entrance, and they will all readily run in.

The queen usually makes for the lifted hive, and is followed by the rest. She can be easily recognized, as she is not so broad in shape as a drone, but longer than the working bee, while her wings are much shorter than those of either. When the swarm find the comb foundation, they soon set to work to furnish their new home. Quilts—the inner one of American cloth or calico, and the outer of felt—must be provided to fit over the frames. In very wet chilly weather it is prudent to feed the newly hived swarm for a few days with a little syrup, or the bees will grow weak.

Harvesting the Honey

After working for about five or six weeks, stock-hives should be furnished with supers—in fine hot seasons about the end of May—to be in readiness for the honey-flow. This sets in when the white clover is in full bloom. In heather counties the bees are moved up to the moors when the clover harvest is over, but it is not advisable to mix the honey in this way. The honey from garden flowers and clover is light in colour, while heather honey is usually dark. In June and July, when bees work hardest, three or four supers may be placed on one hive, and either full sheets or narrow strips of comb foundation should be placed in each section.

The sections must remain on till full and capped over, then be removed and stored in a warm dry place till needed for market. Any bees remaining on the sections when removed should be gently brushed off by a goose quill on to empty frames.

Marketing the Honey

Well-filled sections should weigh about 1 lb. each, and usually fetch from 1s. 3d. to 1s. 6d.

per pound retail. Heather honey, though dark in colour, is very delicious, and sometimes sells for as much as 1s. 6d. per pound. If glazed, the sections travel better packed in hay, and are much improved in appearance, a matter of the greatest importance in preparing honey for market. No matter how excellent the quality, uneven sections, or smeared and badly corked bottles, detract from the value. Honey should not be extracted till the cells are well capped or sealed,

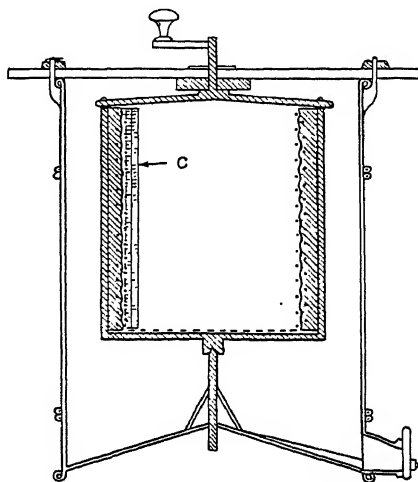


Fig. 90.—Section of a Honey Extractor
C, is the comb.

for this shows that the honey is thoroughly ripe and not liable to fermentation.

The Use of the Extractor

Honey for sale should be extracted from surplus-chambers, or supers placed above brood-chambers. By means of the extractor (fig. 90) the honey is emptied from the cells by centrifugal motion. Since the introduction of this machine, extracted honey has grown very much in favour with consumers, as being free from pollen or brood, besides being untouched by the hands in process of removal.

When using the extractor one should have ready a pair of good uncapping-knives, well sharpened, a deep jar of hot water, and a large basin of cold water in which to dip the hands as they become sticky. Begin by taking a frame of comb, resting the lowering end of top-bar in a dish, and with the

uncapping-knife—just removed from the hot water—shave off one side of capping by an upward movement of the knife. Turn the comb and uncapped the other side; then place it in the extractor and rapidly turn the handle, when the honey is thrown into the cylinder by the rotary motion.

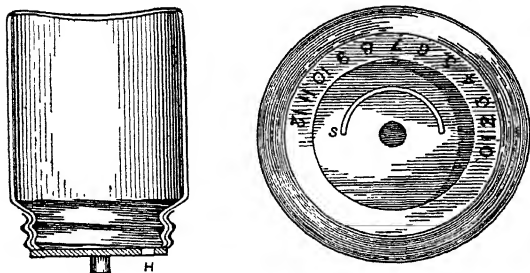


Fig. 91.—Bottle Feeder

s is the slot through which the syrup runs. H is one of the twelve perforations on the cover of the bottle.

Keep Cells Intact

In order to guard against damage to the cells an even speed should be maintained, and as soon as one side is empty the comb must be reversed. The extractor saves the bees much time and labour, and consequently increases the yield of honey, for when the empty comb is replaced in the hive, the process of refilling commences at once if honey is plentiful.

Wintering the Bees

When September comes, the wintering of the bees must be attended to, and each hive should contain about 25 lb. of honey to serve as stores. If sufficient honey is not left, artificial feeding is necessary. Break up 1 lb. of candy and dissolve in $\frac{1}{2}$ pint of hot water. When cold put in a bottle-feeder (fig. 91), which is placed above the feed-hole in quilts, or coverings of frames. Warmth is so essential that the frames must be covered with quilts made of woollen stuff, the double walls of the hives being filled in with chaff or cork-dust.

Diseases of Bees

Bees are subject to dysentery, proceeding from damp hives or carelessly boiled, and

therefore fermented, syrup. "Foul brood" is, however, a serious pest, and must be guarded against by careful inquiry when the stocks or swarms are purchased. Second-hand hives should be avoided. Naphthalene in the hives is considered a useful preventive of infection, but it should be frequently renewed. As a preventive against Isle of Wight disease many feed the winter stocks on bacteriolized candy made to a prescription of the Ministry of Agriculture.

How to Handle Bees

When handling bees it is well to wear a veil, but not gloves, as, if the bees have been alarmed by a puff of smoke driven into the hive by means of a bee-smoker (fig. 92), they at once gorge themselves with honey and are not then inclined to sting. Before swarming, they fill their honey-sacs, and are in a fairly amiable mood; but the evening is the best time for hiving swarms.

Queens may remain fertile for four or five years, but to keep the stock strong and healthy renew the queen every two years. The cages in use make queen introduction quite an easy matter. Should a stock become queenless by accident, the bees show restless agitation and work but little; while if there are no eggs or brood in the hive at the time of her loss to raise as queens, the bees soon dwindle and die.

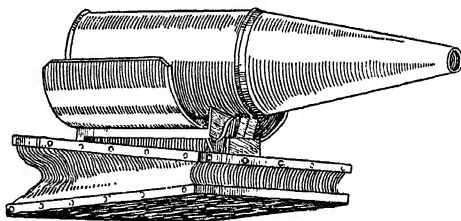
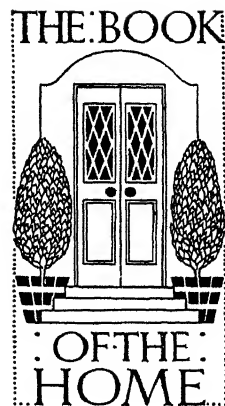


Fig. 92.—Smoker

Useful Information

Authoritative works on the subject have been written by Cowan and Digges. There are several useful journals, and anyone will be greatly helped by joining the Beekeepers' Association, 23 Bedford Street, W.C.2.

HOME OCCUPATIONS FOR PLEASURE AND PROFIT



Home Occupations for Pleasure and Profit

ARTS AND CRAFTS

In recent times, there has been a great revival of all ancient arts and crafts, and the demand for good and artistic work is a large one. The woman with clever fingers can not only follow a craft which will beautify her home, but also produce work which gives her an opportunity of supplementing the family income, without having to go outside her home to do so. There is, however, a vast difference between the work which is done for one's own pleasure and which is acceptable to oneself, and the work which is done for sale in a competitive market. This should always be borne in mind when deciding that a handicraft is to be carried on for profit as well as pleasure.

Working for Profit

If one's wares are to be offered to the public, they must appeal to the public taste; they must be fashionable—up to the minute; or they must possess a novelty or individuality which is both unique and pleasing. It will be seen, therefore, that the work of an amateur must appeal to the public taste as well as to her own. Nor will *amateur* workmanship pass for the real thing in an open market. Articles which are to be sold must be perfect in detail and finish, and to attain such perfection considerable experience—or a full course of training—in the chosen craft is necessary.

The third point, which is of no less importance than the two others, is the finding of a suitable market for one's wares, and offering them at a price at which they will find a ready sale. At the same time they must be priced to give a profit commensurate with the cost and time expended on the work. To do this successfully a certain amount of business acumen is necessary.

How to Sell Work

Handiwork can be disposed of through several different channels. The first and simplest means is to work for friends and a small circle of clients in your immediate neighbourhood. Another means is to dispose of your work through a firm which undertakes to handle handicrafts, either on a commission basis, or by purchasing the work outright. If the arrangement is on a commission basis, the worker must be very careful that the firm handling her work is really taking an interest in their sale, and does not keep the goods for several months, then returning them as not saleable.

Another way to sell one's work is to open a small shop of one's own for the sale of handicrafts and novelties—possibly entering into partnership with one or two other ladies whose work does not conflict with one's own, but appeals to a similar class of customer. This demands considerable business and organizing ability to make it really profitable.

The fourth and last method is to sell one's products by mail; that is to say, advertise them in the right type of newspaper or other periodical, offering to sell ready-made articles at fixed prices, or to take orders for special work. In either case cash should be sent with order. Whenever possible, the article offered should be illustrated by a photograph so that the prospective purchaser may know, as nearly as possible, what it is she is buying.

Packing

Women are notoriously bad packers where parcels are concerned. When, however, a great deal of time, expense, and labour have

been put into the making of an article, it is very poor economy to save on the packing, with the result that the article is likely to arrive damaged in transit. It must also be remembered that the first impression of the article is given by the package, and if this is loose and untidy, the goods themselves will be looked at through prejudiced eyes. Attractive boxes, carefully packed in strong, uncreased paper, give an impression of neatness and efficiency which will be conveyed to the goods themselves.

Needlecrafts

It is useless to deal at length with all the various needlecrafts which can be profitably indulged in. It should, however, be remembered that as needlework is an accomplishment of almost every woman, competition is very keen, and the profits are small unless the worker has some unusual accomplishment, or can turn out work which lifts it above, and makes it distinctive from, the

generality of work. There is always a demand for sets of underwear which combine daintiness and originality. Knitted articles of clothing for women and children always find a ready market, when the knitting is good and the designs are unusual and attractive. There is a wide scope for those who have interesting ideas in the way of furnishing accessories, such as cushions, lampshades, and table-mats which combine individuality of shape with attractive blending of colours. *Real* novelties are always saleable.

Other popular arts and crafts are dealt with at greater length, so that those interested may be able to get some idea of the equipment required to produce well-finished and saleable articles. Private tuition in most of these crafts can be obtained at the Francis-Lewis Studio, 13 Hanover Street, London, W.; and excellent classes are held by the Central School of Arts and Crafts, Southampton Row, W.C. 1.

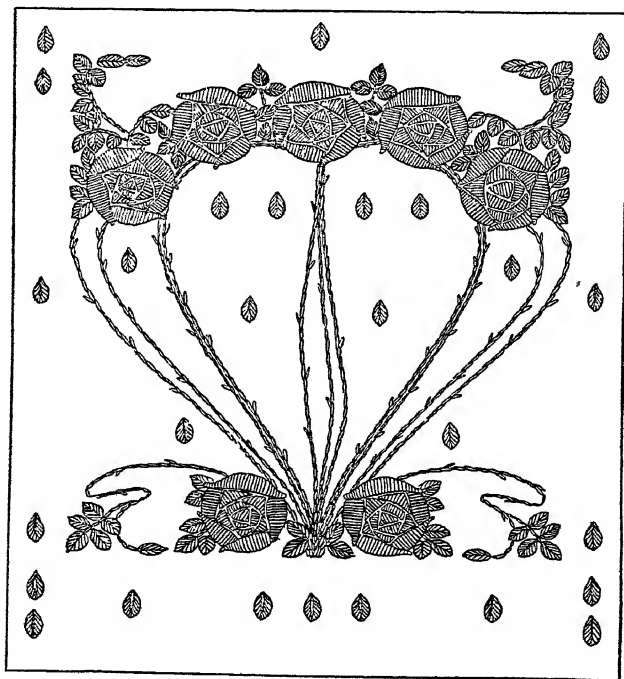


Fig. 93.—Design for Cover of Blotting Book to be embroidered in Silks
The lines on the flowers and leaves indicate the direction of the stitches.

SPINNING AND WEAVING

Hand weaving continues to thrive in spite of the advent of machinery. The reason for the interest and the persistence of the craft is twofold. It is due, firstly, to the inherent artistic quality and durability of hand work; and there is, secondly, a delight and satisfaction in the work itself. For this reason weaving is particularly recommended to people who are convalescing, invalided, or confined to their beds.

Artistic Requirements

Part of the fascination of the work consists in the scope for lovely and unusual colour effects, obtained through the use of different coloured warp and woof, or by the introduction of stripes, borders, or patterns in the jumpers, sports clothes, curtains, scarves, coat stuffs, and children's frocks which are made from materials taken off the loom. This is where a knowledge of or feeling for colour is a necessity, combined with creative ability for new and pleasing effects. The study of colour schemes in nature, landscapes, flowers, and leaves, or—if this is not practicable—of the novel combinations in some of the machine-made stuffs, always results in fresh suggestions and ideas. A little group of weavers abroad used not only to get their suggestions from nature, but would name their pieces accordingly—"leaves in autumn", "snow in the woods"—and their scarves for the table were woven to suggest a scene.

Patience and Application

Weaving requires patience and application, especially when tackling large pieces, intricate patterns, or great lengths of stuff. However, those who follow it as a hobby only, may confine their work to the simpler and smaller things, such as blouse, skirt, and dress lengths, leaving the more ambitious pieces, fine household linens, or perhaps a rare ecclesiastical piece, to the experienced professional at the loom.

Actually, the most tedious and difficult part of weaving is the laying of the warp.

Then with the woof comes the pleasure of watching the piece grow. The work is sedentary, but it is necessary to work the pedals of a large loom with the feet. Where foot-work would be a strain, it is possible to substitute the table loom, which is smaller and is worked entirely by hand.

Instruction Needed

Three months of instruction and practice in weaving, daily from ten to five, comprises

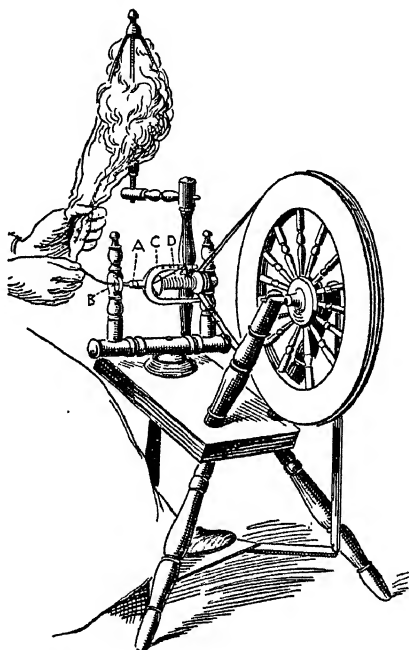


Fig. 94.—Early Saxony Spinning Wheel

A, Spindle. B, Eye of needle. C, Flyer. D, Bobbin.

a fairly thorough course in weaving. Some pupils master the fundamentals in less time, but where it is feasible, it is better to have the full advantage of the training. Spinning and dyeing should also be learnt, because of the immense saving effected when the weaver spins and dyes her own wool. Fleece may be purchased from the farmer at a very small cost, while wool for spinning is very expensive to purchase.

The colours obtained by home dyeing with vegetable dyes are not only beautiful, but permanent as well; and many weavers like to gather their own lichens, roots, and herbs for dyeing. Spinning and dyeing may be mastered in a few lessons, and courses in these and in weaving may be had at the Alston Weaving Studio, 50 and 51 South Molton Street, London, W.1.

laying the warp, bringing the whole, including the loom, to somewhat less than £15. The small table looms for weaving small pieces, jumpers, skirt lengths, scarves, vary in price from 3½ guineas to 6 guineas.

The prices of materials used in weaving are roughly as follows: warp cotton, 3s. or 2s. 6d. a pound in cream; cotton for weaving,

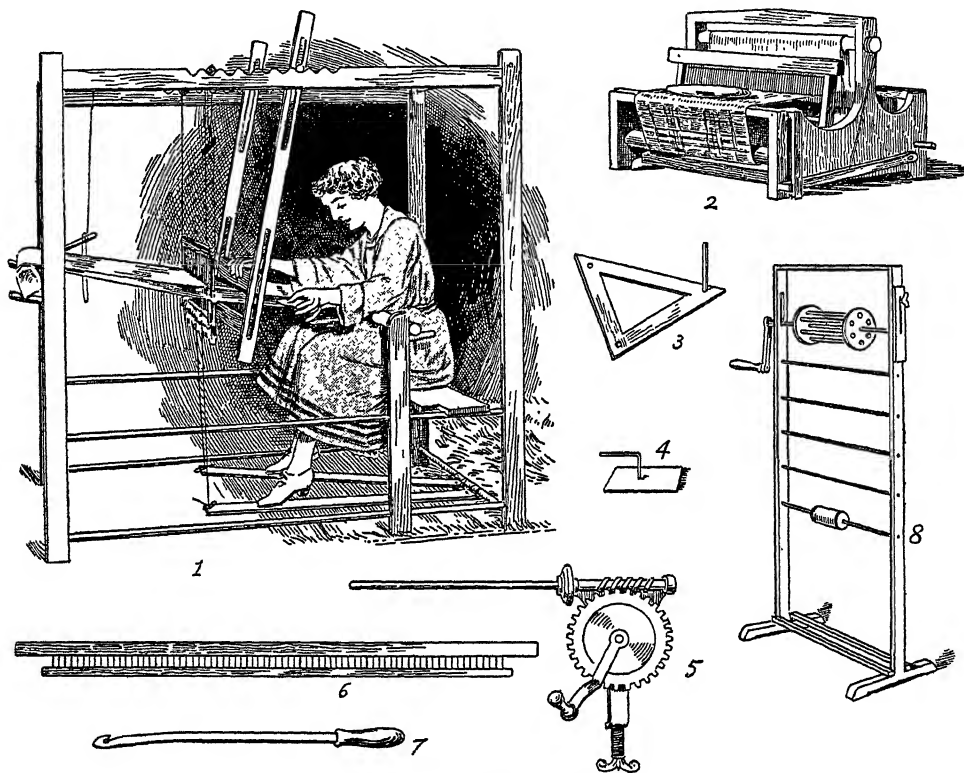


Fig. 95.—Hand Weaving Equipment

1, Greek hand loom. 2, Table loom. 3, Warping triangle. 4, Warping staple. 5, Metal winder. 6, Raddle. 7, Reed hook. 8, Bobbin stand and skein holder.

Equipment Required

The outfit required is first of all the loom, which, all threaded, is about £10, 4s. 8d. A set of staples for laying the warp is also necessary, and a combined bobbin stand and skein holder, a metal winder, a reed hook, a raddle comb for combing out the wool, an extra shuttle, and a triangle used when

laying the warp, bringing the whole, including the loom, to somewhat less than £15. The small table looms for weaving small pieces, jumpers, skirt lengths, scarves, vary in price from 3½ guineas to 6 guineas.

The Process

In weaving, first the warp must be laid.

The width is decided, and the number of threads, and the length. The threads are measured out, being wound about the staples in the process to prevent knotting. They are then plaited, and threaded through the harness and attached to the loom. The

weft is wound on the spool, put in the bobbin, and the bobbin is shot across between alternate sets of threads, which are lifted in turn by the harness attached to the foot pedals. Lengths of material may be cut off at the desired length.

PAINTING AS AN APPLIED ART

Painting as an applied art furnishes an interesting field for the artist who, through lack of time or for some other reason, cannot pursue pure art, or for the person with some artistic training who wishes to put it to practical use. The oil painter will find opportunity to use oils on many materials, such as parchment, silks, and other stuffs, wood, and even for mural painting. The water-colour artist may do very attractive work on silks and satins, parchment and wood, to be made up into practical articles.

Anyone with a knowledge of painting can use the gold, silver, and bronze powders of Florescan work on many materials, including metal and glass. Pen-painting powders are used on gauze, satin, and velvet; coloured stains on leather and wood; and dyes on all kinds of stuffs. In each case a special medium is used, and a suitable style of design and decoration planned. Otherwise the same work is done in practically the same way as on paper or canvas, furnishing the same outlet for artistic expression.

Utility and Beauty

Objects for everyday use may be transformed by a little hand decoration into something quite distinctive. When the work comes from the hand of an artist, it should be distinguished by that ideal combination of utility and beauty. This, of course, is the goal of all those artists who, like William Morris, realize that utility and beauty should go hand in hand.

Suitability is one of the secrets of beauty. Articles to be decorated by hand should not only be made of suitable materials—like linen, where they are to have hard wear, and pale satins, where daintiness is the only concern—but the decoration should be carefully chosen.

Stiff, conventional designs are as inappropriate on trousseau work as sentimental ones on a linen or leather desk set. This is where the true artist has an opportunity to excel, especially with the added freedom in choice and execution which the knowledge of drawing and colour gives her.

For Personal Use

Hand painting may be used on articles of clothing. There are many delightful possibilities. One of them is the revival of the old Florentine style, where rich silk and velvet gowns were graced with hand-painted panels. Florescan powders are used for this, in gold, silver, and bronze tints. Evening wraps are similarly treated, life-like birds or dragons on black satin being particularly gorgeous in effect. Scarves of chiffon or other sheer materials may be made exquisite with hand-painted designs. Trimmings, ribbons, hatbands, underwear, all lend themselves to this style of decoration.

Of course the opportunity for the making of objects for personal use is endless. Sachets, handkerchief cases, pin-cushions, lingerie bands, and all sorts of dainty things for the dressing-room and boudoir are adapted to this sort of work and find a ready market.

Painting on Furniture

Some very beautiful effects are possible in furniture. Cabinets, buffets, and chests may have panels with elaborate hunting scenes treated in the manner of mural decoration, or simpler corner designs, which may be used with equal success upon tables, tea-wagons, trays, bedroom sets, drawing-room pieces, and pianos. Painted fire screens in wood or leather are particularly effective.

Frames, mirrors, small boxes, desk and bureau sets may be hand painted. And the ambitious interior decorator with a mastery of drawing may even attempt wall decoration, nursery pictures and fairy scenes for the nursery being the most in request.

Of course, hangings, draperies, bed coverings, centre-pieces, cushions, doyleys, and tray cloths come in for their share of decoration; but when using this form of ornamentation it is best, of course, not to have too much of any sort of hand painting in one room, as it is liable to appear monotonous and commonplace unless used with restraint.

Artistic Requirements

Naturally, artistic ability is the first essential requirement. Hand work is always more expensive than machine-made articles, and people who are appreciative enough to buy, usually look for good design. In all hand painting, a love of detail

painted on flesh-coloured satin, are so delicate that a touch would ruin them. This is where artistic training and a sure hand are so essential.

An eye for colour is necessary as well, but in every form of decorating on materials it is necessary to experiment on an odd sample of material, not only for different colour effects, but for the right medium with which to mix the colour. A medium or colour may give quite different results on a different ground.

Florescan Painting Outfit

"Florescan" painting or painting with metallic effect may be used with success on all materials. The outfit required may be had in a cardboard box for about 5s. This includes seven glass tubes of bronze colours, a bottle of medium, and a brush. The colours purchased separately are 6d. each. The mechanics of this painting may be mastered in two or three lessons.

A little medium is put in a saucer, and a little of the various colours required on a china palette. The brush, which is held upright, is dipped into the medium, then into the powder, rubbed on the palette with a circular motion to spread the powder evenly—which is most important—and is then rubbed gently on a piece of blotting paper to remove any roughness. The material is stretched and pinned down as for stencilling, and the powder is rubbed up and down through the stencil. Where a stencil is not used, the design must be drawn and then painted in.



Fig. 96.—"Florescan" Painting Outfit

is necessary, each and every branch requiring meticulous care in finishing, so that the work should look professional. Daintiness and neatness depend on getting the right effect at once. One needs to be a sure worker, so that the work will appear fresh and bear no traces of handling when finished. Some pieces of work, such as sachets, hand-

Pen-Painting

The method of pen-painting is slightly different. The outfit, consisting of nine pen-painting colours, a bottle of special medium, powder, palette knife, pen-holder and pens in a box, costs about 8s. 6d. One part of powder is mixed with two parts of white with a palette knife, to make a smooth paste, which is divided into as many parts as required. It is tinted by adding colour

gradually, it being advisable to use two or three shades of each colour. A drop of medium is added immediately before using, and mixed well. The colours are then applied to the material with a pen, and should be picked up in small lumps or rolls varying in size and form, according to the shape required. Gauze, satin, and velvet are

the brush on the palette, and dried on a clean rag. The brush is then rubbed lightly over the parts to be painted. By the use of a special medium, colours are rendered transparent, as for silk lamp-shades, where opaque colours would prove too dark. Oil colours are rendered washable when a damp cloth is put over the work, and it is ironed

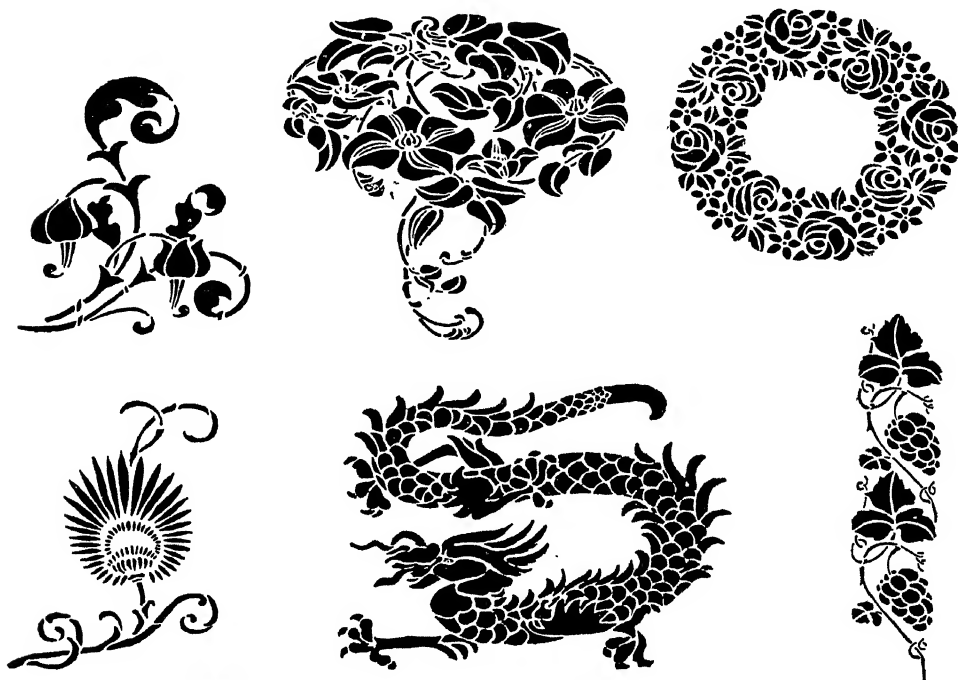


Fig. 97.—Stencils for Florescan Stencilling (Winsor & Newton, Ltd.)

used for painting on, and small flowers when carried out in Rococo style are particularly beautiful. It takes three days for the painting to harden.

Oil Stencilling

The oil-painting outfit consists of a box containing eight colours, a bottle of medium, two brushes, opal tile, and stencil. For oil painting a little of the required colour is squeezed on to the palette. A few hairs of the stencil brush are dipped into the medium (which has been previously poured into a small vessel). The colour is rubbed well into

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with a fairly hot iron. It is then pressed on the wrong side to finish.

Water-Colour Box

A water-colour outfit containing eleven colours in tubes, a bottle of medium, and three red sable brushes may be had for about 20s. The process is similar to oil painting, but for each and every kind of painting a special medium is used. Mediums, of course, take the place of the old-fashioned white of egg, &c., which were once used to prevent the colour "running".

Preparation of Materials

Painting on furniture may be done with oils, where the effect desired is slightly high. The wood is always very carefully prepared, rubbed down with sandpaper, dampened, and rubbed down with sandpaper again, so that the grain of the wood does not stand up rough. The design is traced upon the wood and then painted. Where stains are used the wood is likewise carefully prepared. If decorative outlines are painted in black or green as the case may be, according to the wood used, this forms a tiny ridge and helps to prevent the spreading of the stains over the outlines.

For wall painting, decorators' oil colours are best, but as these must be purchased in large quantities, the amateur does not, as a rule, undertake this work.

Length of Training

Those who can afford a full year's training in art work should be able to tackle the applied arts in a comparatively short time. In all branches of painting some training in art is absolutely necessary; and where figures are used, as in mural decoration, for instance, poor drawing is quite inexcusable.

If it is not possible to set aside the necessary time for a full course of training, a branch of decoration might be specialized in where only conventional or simple designs are necessary, or ready-made stencils and designs can be used, meanwhile training for the time when one can make one's own original designs.

Hand Dyeing

Many delightful effects may be achieved by hand dyeing. For pale tints a dye which does not require boiling may be used. The method for using boiling-water dyes has been thoroughly explained in the section on *Cleaning* in Volume II.

Batik dyeing produces the most artistic effects. This is an ancient Javanese craft

which was widely carried on in many Eastern countries, and is now being used with great artistic effect by European craftsmen. In batik dyeing, the design is laid on to the material with hot melted wax before the material is dipped. The wax is afterwards removed by immersion in petrol, leaving the design untouched by the dye except where small cracks in the wax have allowed it to penetrate. By several successive applications of wax, leaving different portions of the material exposed each time, several colours may be applied—always starting the process by using the lightest colour first.

Tie-Dyeing

This is a very simple process by which shaded and butterfly effects are applied to materials. In tie-dyeing a small piece of the material is caught and tightly tied off with cotton. This is turned in and another "head" is tied off. Turn this in again, and continue until the material presents a large "head" with only the four loose corners left. These are dipped, the dye spreading no farther than the line of the cotton. Then another "head" is untied and dipped in a different shade or colour, and so on, until the centre of the "head" has been reached.

Materials so treated may be used for wearing apparel and trimmings of all kinds, or for articles of interior decoration such as cushions, bed-spreads, lamp-shades, and many other decorative accessories.

Where objects which are already made up—such as lamp-shades or dance slippers—are to be treated with dye, an interesting way is that of spraying the colour on with a vaporizer. When a design is to be applied, a silhouette of the design cut out on paper is first laid on; this keeps the colour away from the silk underneath it. When the silhouette is removed, the effect is similar to that of batik. Other effects may be obtained by spraying with different colours—shading them one into the other.

LACQUER-WORK

Lacquer-work is an old Chinese art, the secret of which has been carefully guarded from the Western world. Whether it is some chemical, some special mode of manipulation, that gives Chinese lacquer its peculiar finish, not unlike metal, is not positively known. The lacquer-work done here, therefore, while endeavouring to maintain the Chinese spirit in the design, is quite Western in workmanship.

It is a fascinating art, and those who follow it enjoy the delicate artistry which transforms such various objects. Almost any hard surface will take lacquer, so that lamp-shades, tea caddies, screens, frames, trinket boxes, and trays, are some of the pieces which may be so treated. Old pieces of furniture may be renewed with lacquer, but these must first be washed with ammonia and water.

Essential Qualities

Those who desire to take up lacquer-work must have some artistic training behind them, or at least some feeling for design. For, while units are often taken from the old Chinese designs, it is necessary, always, to arrange and adapt them to the shape to be decorated. Birds, flowers, bridges, waves, rocks, and gnarled trees must be arranged in satisfying relationship. And, while perspective is not used, and the objects in the background are often larger than those in the foreground, draughtsmanship is necessary to sketch these in with proper effect.

Then, too, the fineness of line, as in the old lacquer-work, gives quality to the work. Care and conscientiousness are necessary, too, for every detail must be done according to rule, or the lacquer will crack. If a little dust falls upon one of the under coats, the imperfection will show through when the work is done. The work requires patience and plenty of time, for there are about six processes, and the various coats take about twenty-four hours to dry. Those who are working for profit, however, catch up on the matter of time by starting several pieces at the same time, all receiving the first coat

and being left to dry, a new lot being started the next day, while the first trayful is getting ready for its second coat, and so on. At the end of the week many pieces have been finished. Caution, too, is necessary in the handling of the materials, which are inflammable.

Lacquer-Work Course

A course of ten lessons would give a good foundation for lacquer-work, especially for those with a fair knowledge of design. The course should, however, be supplemented by a study of the beautiful examples of old lacquer to be seen at the museums—the British and South Kensington especially. The advanced student may always take additional lessons for more difficult effects. Courses may be had at the Francis-Lewis Studio, 13 Hanover Place, London, W.1.

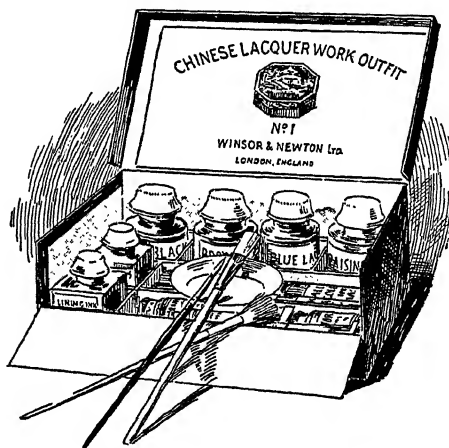


Fig. 98.—Lacquer-Work Outfit

The Outfit

A lacquer-work outfit includes bottles of red and blue lacquer, raising paste, special polish, special medium, and lining ink, tubes of oil colour, burnt sienna, chrome yellow and vermilion, half-tube of water-colour, ivory black, six glass tubes of assorted coloured bronze powders, china

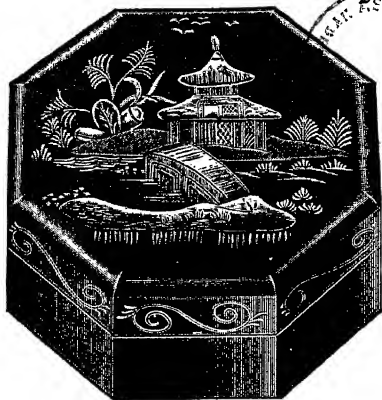
tinting saucer, and three brushes. The complete outfit costs from 15s. A sheet of designs may be had for 2s. However, the artist in lacquer receives a good price for his work when it is good, and so can soon make up his outlay. Plain wooden or cardboard articles for working on are inexpensive.

The surface of the work to be lacquered is prepared by being rubbed smooth with fine sandpaper. The grain of the wood is filled in with a glue, whitening, and plaster paste, which is allowed to dry. It is rubbed smooth. A coat of black is then applied, allowed to dry for about twenty-four hours, then another coat of black is given. The design is marked on with chalk, and the bridges, pagodas, or trees which are to be brought out in relief are raised with a mixture

dropped from the brush. The bronze powder is dusted on before the work is quite dry. The fine lines and details are painted in later, and the whole finally varnished.

Sealing-Wax

Ordinary coloured sealing-wax can be utilized for making many small and attractive novelties. Hat pins, in peculiar shapes, are made with a marbled effect which is produced by combining sealing-wax of several different colours. Medallion trimmings may be made in a similar way, and clever fingers can even use sealing-wax for "lacquering" small boxes, the chief difficulty being to obtain a perfectly smooth and glossy finish. Also, sealing-wax is very liable to crack.



Hexagonal Trinket Box

This small box is useful for a beginner. It can be executed in any colour, and the design illustrated embraces a sample of the various kinds of decoration—viz. flat, shaded, raised—used in lacquer.



Round Tray in Black Lacquer

This very attractive tray was originally used in a little inn and had a printed advertisement on it. It was rubbed down well, lacquered, and decorated. It is one of the nicest pieces of lacquer turned out by the studio.

Fig. 99.—Examples of Lacquer-Work at the Francis-Lewis Studio

BASKETRY

Basketry is such an old and primitive handicraft, that it seems to belong very intimately to the home. It was a favourite occupation of the women of primitive races—like the American Indians—and still is the staple industry of modern families in country places. In parts of France, the designs of certain pieces of basketry are handed down in one family from generation to generation.

Basketry is the one craft that has never successfully lent itself to machinery, because of the shaping, which must be carried on throughout the making as the work grows under the hand, and also because of the finishing, which cannot be achieved by machine.

Indeed, these two very important processes of shaping and finishing are the basis of basket-making. Those intending to take up basketry should possess patience and care, to ensure the constant and insistent shaping that makes for firmness and symmetry, as well as strength and beauty of outline in the finished work. To ensure the professional look, neatness and durability must characterize every completed article.

An Easy Craft

Basketry is a light and easy craft. When the hand has acquired deftness, which comes with practice and from watching an experienced worker, it requires care but not great concentration. New strands must be introduced with care to make them secure. Care is needed in the trimming of ends to keep the work neat; in the singeing at the end to guard against blackening; and in the firm holding to keep the work uniform and strong. For this it requires a strong hand; yet strength, like deftness, is acquired with practice. It is a craft that almost anyone can learn easily, especially those whose sight will not allow of more trying work, for basketry is one of the crafts carried on with great success and profit by the blind.

A Profitable Industry

When this craft is to be followed for profit, ingenuity is necessary in thinking out shapes and designs for innumerable useful objects for the home: cord-ball holders to hang from the wall, napkin rings, work baskets, linen baskets, plant containers, garden chairs, table mats, trays, sandwich and fruit baskets, hampers, and all sorts of baskets and containers. Some of these are of cane or wicker, some of cane and raffia, some of raffia alone, some of cane and rush. Originality is necessary, too, for the invention of odd and beautiful shapes, and the little touches that make each piece interesting and different.

Some artistic taste is a great asset. Borders of quaint and unusual design, the introduction of pleasing patterns and unexpected bits of colour, are really needed to transform objects of basketry into something distinctive and outside the usual run. It is this added attractiveness which makes work readily saleable. Cane and raffia may be had in so many lovely colours—heliotrope, terra-cotta, blue, gold, turquoise, orange, and brown—that there is much opportunity for artistic work. Often, too, with the natural cane, enamelling or gilding may be used for decorative effect.

Courses in Basketry

A course of twelve lessons, of an hour and a half each, is needed as a good foundation in basket-making. This will enable the learner to master the essentials, the methods of workmanship, the various weaves and shapes, and it will give her an insight into the variations necessary for the creation of new weaves and shapes. After this foundation course, which may be taken at a technical school or at any of the training schools in arts and crafts, there is the fascination of developing new forms and designs, with the opportunity always of taking an occasional

lesson for new instruction and ideas. Private instruction is given at the School of Basketry, 18 Berners Street, London, W.1, and many other places.

Equipment Needed

Few tools are required. There is a pair of nippers for cutting the cane and for trimming ends. They last indefinitely, and seem to become sharper with use. There are two piercers, one blunt and one sharp, for making openings in the weaving, boring

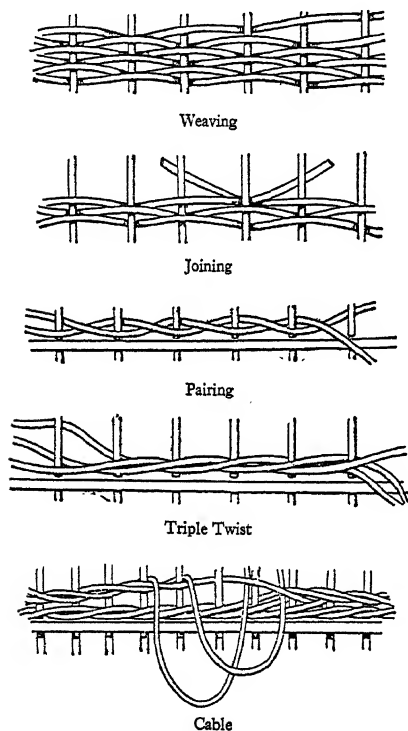


Fig. 100.—Cane Basket Weaving

holes, and so on; a singeing lamp to remove the roughened hairy appearance of the cane in the finished work, which comes from handling. A lamp similar to those used by jewellers and artists is preferable, because there is less likelihood of such a lamp burning or blackening. A foot rule, and a sponge for dampening the work are also necessary. Long raffia needles and the shorter ones should also be kept at hand.

For making bases and lids for square baskets a screw block is needed, size 14 in. by 18 in. Cane varies in price from 2s. 6d. to 5s. a pound. The finished article is worth at least double the cost of the materials. Raffia and rush are 1s. 6d. to 3s. a pound.

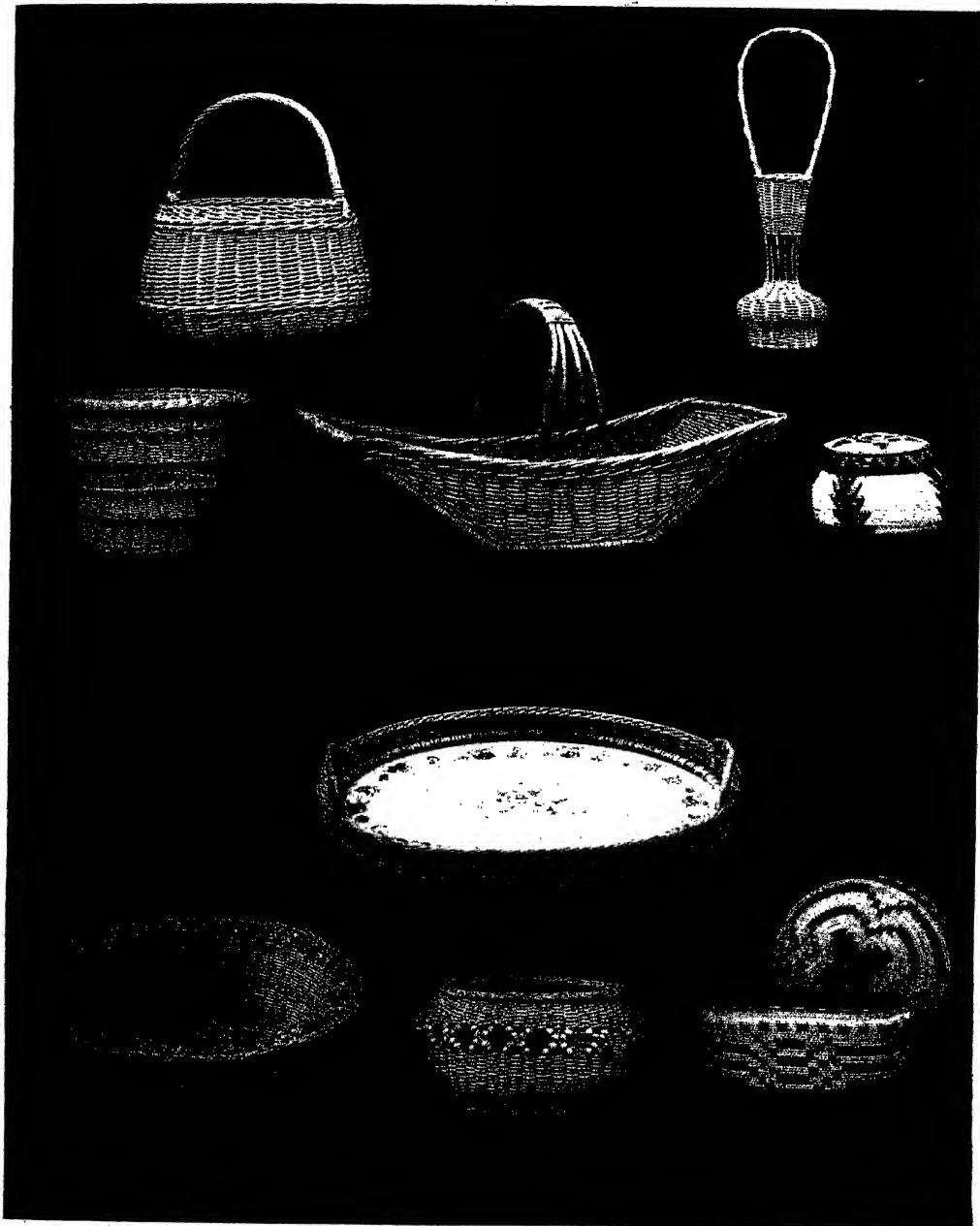
Method of Working

Cane-work consists principally of weaving. The long pieces of cane or wicker are cut the length needed to form the spokes of the basket, five are split and the other five slipped through to form the base. Two strands of cane are introduced, and with a deft twisting motion these are brought alternately behind and in front of these stationary spokes. Borders and coloured cane are introduced during the process of weaving.

Raffia Work

Raffia work is at all times a fascinating craft, because of the many different colours used in this work and the fascinating results obtained. Raffia mats are made by twisting coloured strands of raffia around two or three pieces of flexible cane, or sixteen strands of raffia will make a basis of similar strength and thickness. These ropes of raffia are then knotted closely and sewn tightly together with a needle threaded with raffia, catching each row to the row before at regular intervals and with decorative effect. Raffia baskets are made in a similar way, but after the basis has been completed the sides of the basket must be carefully coiled and sewn so that the shape is regular and the line good. Coloured raffia is also used in a knotted form to make a mesh for market baskets and cord-ball holders. Rush chair seats and backs are made of raffia twisted over the chair rails and woven.

For trimming purposes raffia is most effective. Garden hats embroidered with coloured raffia are most delightful. Market baskets in black American cloth trimmed with coloured raffia are inexpensive and fascinating; while cane baskets of every kind can be improved by the introduction of coloured strands of raffia to make a border or a design.



BASKET WORK

Baskets of Cane and of Raffia, made at the London School of Basketry, Berners Street, London.

LEATHER CRAFTS

There are various ways of treating leather, from the simple cutting out of suède folders for memorandum pads, to the most elaborate tooling with the use of gold—as in the old Florentine style which the Italians still use for chests—and the fine examples of book-binding set with jewels.

For the various branches, different qualities and talents are required. The more complicated work of tooling, modelling, and colouring requires considerable training. Indeed, workers in leather agree that those desiring to take up this work must be very good draughtsmen, with some knowledge of modelling. This is so, because many of the more beautiful and elaborate pieces, such as chests, mirrors, panels, and frames, employ draped figures, animals, landscapes, fantastic figures such as dragons, in their designs; and these require not only draughtsmanship, but also an art training for figure construction and line.

Suède Work

Suède work is comparatively simple. Suède hats, gloves, covers, bags, cases, bureau and table scarfs, motor shoe muffs lined with fur, are some of the articles made. One must, however, possess a little artistic feeling and some originality to dictate the use of colour, beads for trimming, and the odd touches which add distinction to a class of work which is done by so many. When a small notebook cover is cut out and a silhouette applied in leather of contrasting colour, it would lack interest unless distinctively and in-

dividually touched off with lacing, gilt beads, or something to give it an unusual touch.

Accuracy is a necessity, too, a deft light hand, which accomplishes the work quickly without much handling. Suède, especially in dainty colours, does not allow of much fingering. Hats require ingenuity in shaping and trimming.

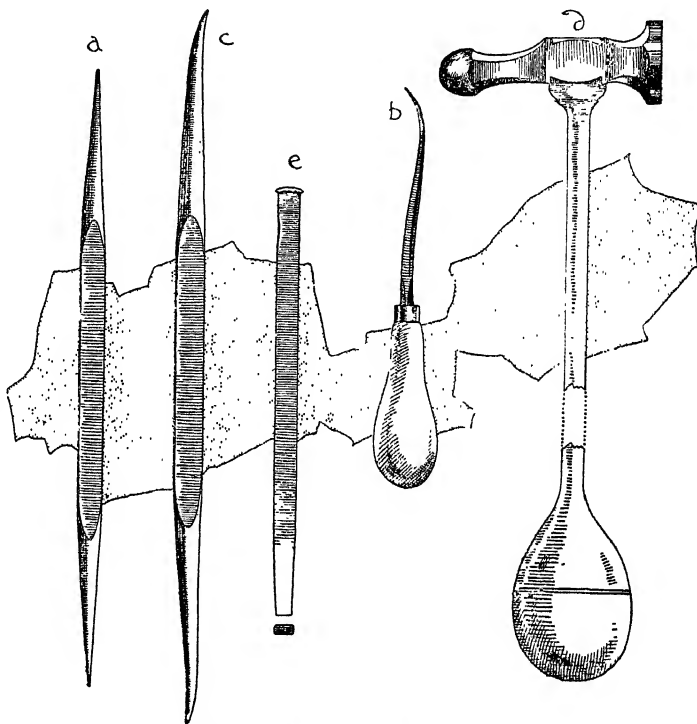


Fig. 101.—Tools for Leather Embossing

a, Tracer. *b*, Bent awl. *c*, Modelling tool. *d*, Hammer. *e*, Punch.

Very few tools are required for suède work: a punch for about 3s. 6d.; sharp scissors or a knife for about 3s.; a heavy metal ruler and a metal set square for cutting accurate angles. A knitting needle may be used for marking. Only a lesson or two are necessary to learn to make articles of suède. The principal processes are cutting-out—which may be done from patterns in the

case of hats or gloves—thonging after punching along the edges, or sewing by machine, as in sports hats, and then trimming by applying designs of beads or coloured leather, glueing on silhouettes of different coloured leather or whatever looks pleasing and novel.

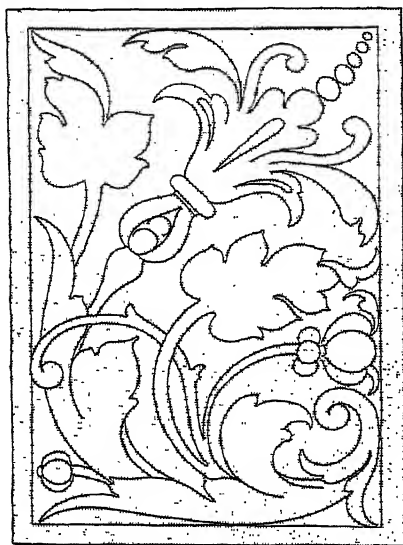
Modelling and Embossing

For leather modelling and embossing, about £3 should be expended in tools

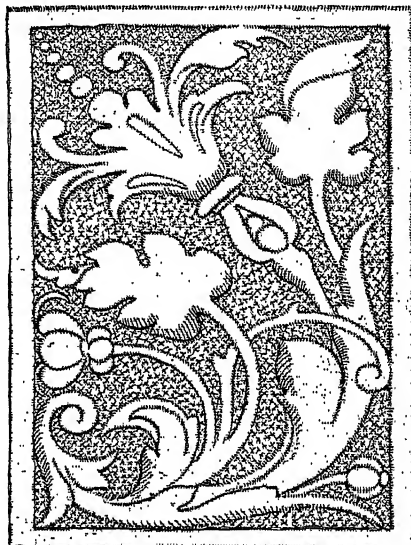
edges, which are afterwards cut away. The leather is moistened with a sponge on the under surface, and then fixed right side up to a board by means of drawing-pins. Calf-skin need not be moistened unless it is unusually tough.

Method of Working

An expert may pencil or indent a pattern directly upon the leather; ordinary workers should draw the design on paper and pin



Back of Case: design traced



Front of Case: completed work

Fig. 102.—Embossed Leather Card-Case

(fig. 101), which include a modeller, a tracer, ruler, and set square; a marble to work upon, stains at 1s. 9d. a bottle, acids at 6d. a bottle, brushes, punch, paring knife, screw crease, hammer, pliers, and beveller. A course of twelve lessons, six of them devoted to the mounting of leather articles, would start the amateur on her way, providing she already has a knowledge of design and drawing. To this the professional would have to add many hours of practice at home to acquire a sure and professional touch.

The leather chosen to work upon must be homogeneous in texture, as far as possible, and rather a larger piece than seems necessary should be used, as it is held down at the

it into position. The outlines on the paper are then followed with the tracer with force enough to mark, but not to cut the surface of the leather underneath. When the paper is removed, the tooling can be commenced. All the outlines of the pattern are next incised with the tracer held like a pencil and pushed along the course to be followed. Careful sponging is resorted to when the leather becomes dry and tough.

The background must be pressed down next, and for this a modeller is used, with the work laid on the marble. This brings the design into relief. Punching, the last process, is very easy, but must not be overdone, either in the details of the pattern,

where it may be introduced for the sake of variety, or on the background itself. The punch is held upright and struck smartly with the hammer, leaving an impression of the design on its base. There is a great variety of punches, marking a star, trefoil, scroll, circle, or other device. The work, when finished, may be either varnished or, if preferred, may be painted or gilded. In modelled leather, filling is sometimes used at the back to keep the work raised.

Mounting and Marketing

Amateurs may have their work mounted by a bookbinder, or a dealer in tools. But those who make leather articles for a living maintain that having this done outside eats up part of the profit. Of course it takes time to mount articles, but with practice one becomes more expert, and quicker. Leather workers have various ways of computing the profit. One way is to ascertain the cost of the materials used, and reckon the time as at the rate of so much per hour. To this is added one-third for overhead charges, and a further one-third for profit. Thus a piece of work costing 9s. in material and time would sell for 15s.

Some of the favourite objects made in this manner are screens, pocket-books, book covers, chests, mirrors, cigar and cigarette cases, match boxes, and panels. Colouring makes leather work more appreciated. Samples of excellent leather work may be seen at the studio of Miss E. Ellin Carter, 3 "Stratford Court", in Gees Court, Oxford Street, W.

Bookbinding

Bookbinding is one of the old crafts in which the workers took a great pride, and every binder of books aimed to become a master craftsman. In this craft a thorough training is necessary, and a love for books, both their contents and coverings. The best binders usually endeavour to have bindings which harmonize with the contents, and

express the spirit of the age. Indeed, some go so far as to produce period bindings, for which a special knowledge is necessary.

Old bookbinders speak with pride of the master binders who did not consider a lifetime too long to devote to the attainment of perfection and eminence. However, as some beginning is necessary, a year's daily tuition, or a full course at a technical college should be sufficient to give the learner an opportunity to launch herself on the road.

The beginner should spend about £3 as an initial outlay for tools, which would include the sewing press which has remained unchanged since the sixteenth century. For the professional a fully equipped shop would be necessary, and other tools might be required as work and necessity dictated.

Rebinding old Books

This is perhaps the most lucrative branch of the profession, as the bindings of many old editions need to be carefully restored or entirely replaced. Often the book is one of a set, and the binding must match exactly the old bindings of the other books. In rebinding old volumes, the old covers are removed and the binding stripped from the boards. The contents are tightly sewn. The new bindings are then mounted on to the old boards, or new boards are cut, and the cover is attached to the book. The leather is often elaborately tooled in gold. Sometimes jewels are inset in the covers, and in many rare old volumes, biographical in character, ivories are lifted from the old bindings and reset in the new. The inside of the cover is neatened by the introduction of beautiful marbled papers.

By the merit and individuality of his work, combined with personal effort, the binder creates a market. Exhibitions in Britain and foreign countries are a means of bringing the worker before the public, and of making his work known.

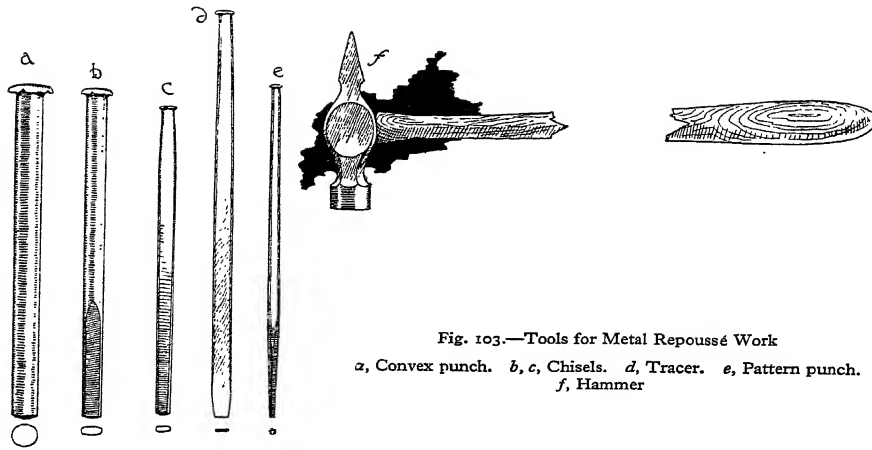


Fig. 103.—Tools for Metal Repoussé Work

a, Convex punch. b, c, Chisels. d, Tracer. e, Pattern punch. f, Hammer

METAL-WORK AND ENAMELLING

The number of women engaged in metal-work and enamelling is so large, that it seems safe to say that it is a profitable employment. It should not be recommended, perhaps, as an occupation for girls who would be obliged to depend on their own efforts to maintain themselves entirely; but to any girl of artistic tendencies, who has the time and money to spend on the training, and need not support herself while she is working up a connection, it is the form of art that offers the greatest opportunities.

A Useful Craft

It has also the following advantages. It can be done in an ordinary room, the outfit—especially if jewellery is the branch of work that is taken up—is neither very elaborate nor very expensive, and the outlay in working is not very heavy. Jewellery is certainly the branch that appeals most to women, and it is also the one in which they are most capable of excelling; but there are many things they can make very well for which there is a large demand, such as spoons, ash-trays, christening-mugs, boxes of all descriptions, flower-vases, cream-jugs, and sugar-basins, &c. These can be made in plain metal—either

silver or copper—or metal ornamented with enamel or stones.

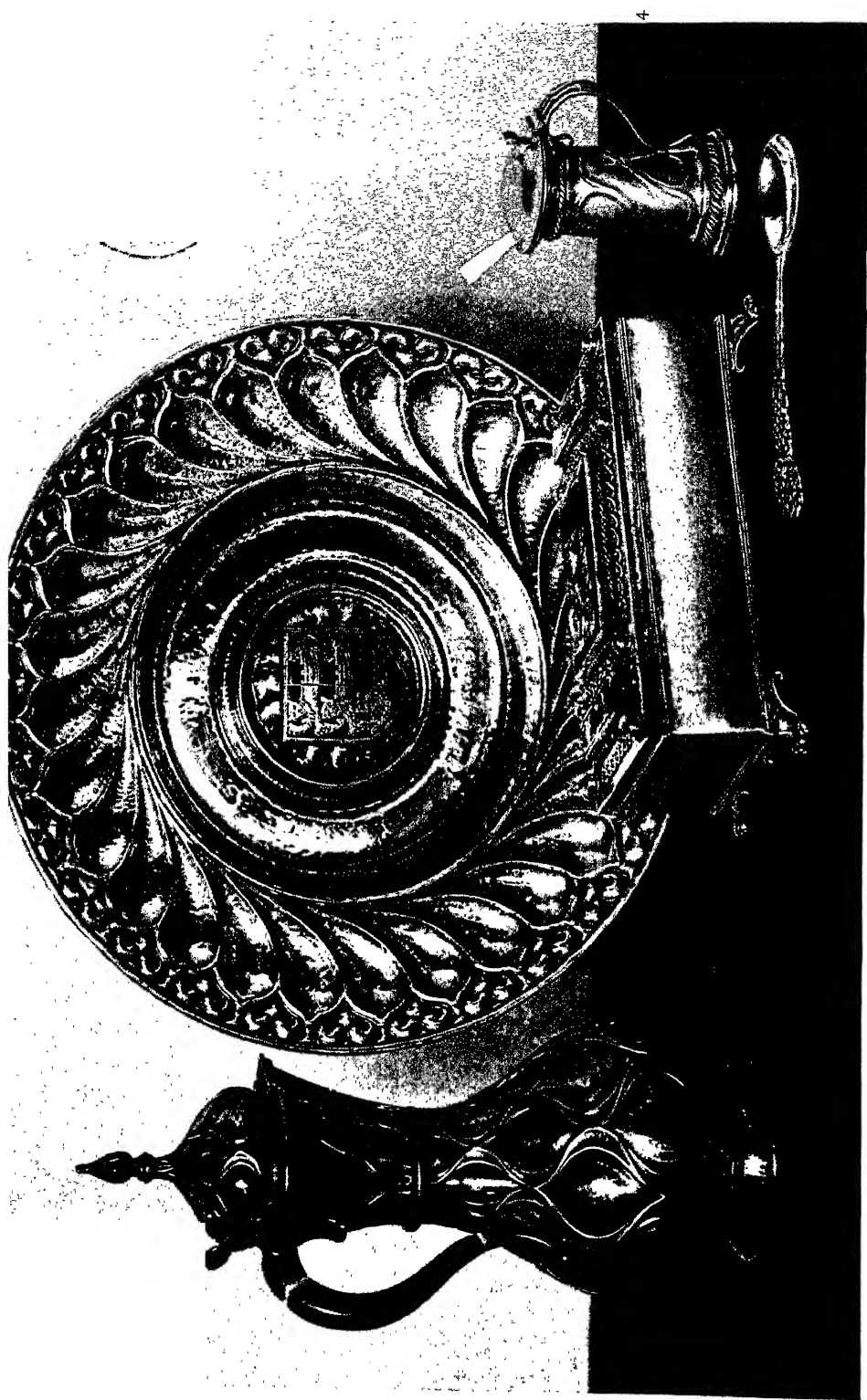
In Pewter and Copper

Metal-work falls under two heads—chasing and embossing, and enamelling. Pewter is the easiest metal to work on and best suited to the feminine hand, because it is soft and requires only slight pressure in the working and modelling. The metal is mounted on wood, leather, china, glass, or even *papier maché*. The designs vary from the simplest to the most elaborate, and often semi-precious stones or enamelling are introduced in the finished work.

The making of jewellery is, of course, the finest and most difficult branch of metal-work, for here the work must not only be well designed but exceptionally well carried out, to enable it to be sold at profitable prices. Copper embossing and chasing is somewhat more difficult than working in pewter, for here the touch must be lighter and the modelling more gradual.

The Outfit

For chasing or repoussé work, the outfit consists of two or three hammers costing



5

3

EXAMPLES OF METAL WORK

1. Copper Coffee Jug in Persian design.
2. Silver Cinque Ports Fruit Dish with Arms in coloured enamels.
3. Silver Cigarette Box with enamelled plaques.
4. Silver Mustard Pot and Spoon.
5. Silver Grape Spoon. (By Omar Ramsden.)

about 2s. 6d. apiece, about a dozen miscellaneous tools costing about 6d. each, and a pitch block. In addition, a few files, a fret-saw, a pair of shears, a vice and a blow-pipe are necessary, and also one or two stakes for shaping bowls and hollowing the centres of plates and trays. For pewter work and silver and copper modelling, two outlining tools are used, a modelling and a finishing tool, an embossing iron, piercer, nail driver—a set of tools, in fact, which may be purchased for about 6s.

There are, however, various chemicals and powders required in finishing, so that it would probably be more practical to purchase a box containing both the tools and the chemicals and powders for about 15s. A plate-glass or marble slab is needed to model upon, and also a square of strong cardboard and one of felt upon which to lay the article while working. The metal itself is purchased in sheets, which are sold in various sizes and at varying prices. Coloured stones used for trimming are quite inexpensive, unless precious or semi-precious stones are used. Wooden boxes for covering with metal range from 6d. to 2 guineas apiece.

Processes of Metal-Work

The processes of jewellery-making include hammering, chasing, modelling, filing, and enamelling. In pewter, the design is traced on, modelled, pressed with a tool, outlined, and chased. Acorns and berries are worked out in high relief. Holes are cut for the jewels, which are backed and pasted. The model is given a "patina" finish with acid in order to colour it, and is then mounted on the box or other object. Copper is treated in a similar way.

Enamelling

The most expensive item of the metal enamelling outfit is the enamelling stove, which costs about £5. This is heated by gas, is clean, and may be used almost anywhere with safety, provided there is an outlet for the fumes—a thick piece of iron should be placed beneath the stove, and a little space left between it and the wall. The enamels are bought by the ounce, ranging from a few pence upwards. There are two kinds, translucent and opaque, and different kinds are used for silver and copper.

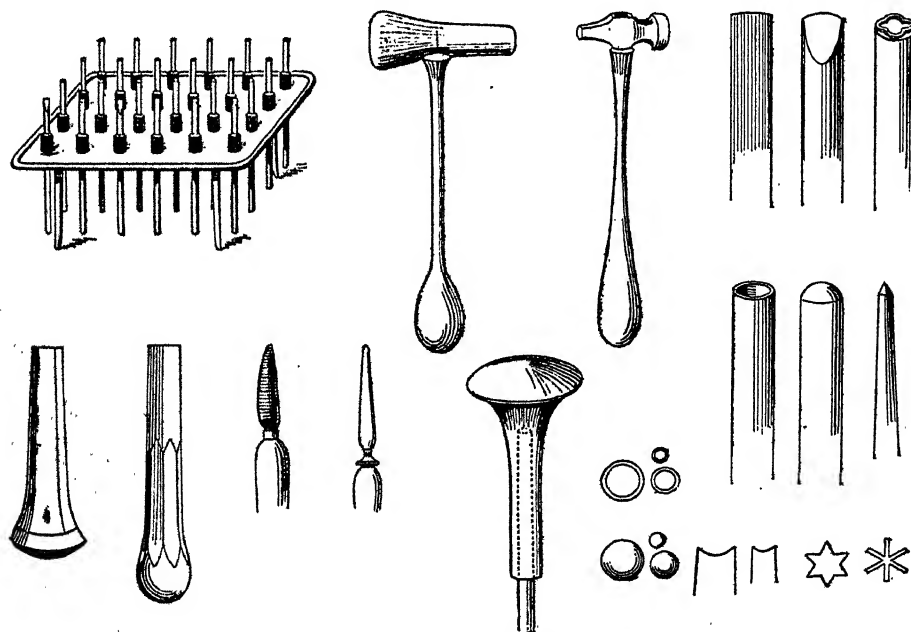


Fig 104.—Tools for Chasing

From the two or three hundred colours, the enameller soon learns to select the needful ones, as it is only an intricate piece of work that requires more than a few tints.

A pestle and mortar for grinding the colours, a few saucers to hold them when ground, a sable brush to lay them on, and a cake of gold paint for outlining, complete the list of requirements.

Enamelling on Glass

Enamelling on glass produces delightful effects. It requires care, but is exceedingly effective with very little effort. The point of the stick is dipped into the enamel, which is worked on round and round to form the petals of flowers or other units of the design. Tiny dot trimmings are dropped on with a brush. The enamel is simply allowed to dry.

The outfit for glass enamelling—a process which does not require firing—consists of enamel colours at 3s. 6d. per bottle, a mixing medium at 2s. 6d., a small stick at 3d., and

THE BOOK OF THE HOMI

a number of sable brushes. A few lessons in this work are quite sufficient.

Training in Metal-Work

There are two ways of training. One is to follow classes at a technical or art school and the second is to serve apprenticeship in a workshop where all the articles are made for sale. The first is cheaper, because most of the art schools have classes in both metal-work and enamelling at a few shillings a month. The two best in London are the County Council School and the school at New Cross, but the training is slow, for classes lasting two or three hours are held only once or twice a week.

For one with a knowledge of design, and natural ability, a six-months apprenticeship in a workshop, where there is steady application each day, and an insight into business methods, cost of production, and the relative market value, would be more practical. The secretary of the Lyceum Club Bureau will give information as to those willing to take apprentices.

WOOD-CARVING AND DECORATING

Working in wood is a craft more generally indulged in on the Continent than in the British Isles. Peasant craftsmen in Italy, France, Germany, Switzerland, and in China and Japan are noted for the artistic work they produce as well as for their ingenious and delightful toys.

Wood-carving is a very old craft, and some of the finest work was done during the seventeenth and eighteenth centuries in England. To-day, however, true artists in wood are scarce in this country. Toy-making cannot be compared with the elaborate panels and pictures of flowers and plants, intricately carved, which take months of patient labour to complete.

Toy-Making

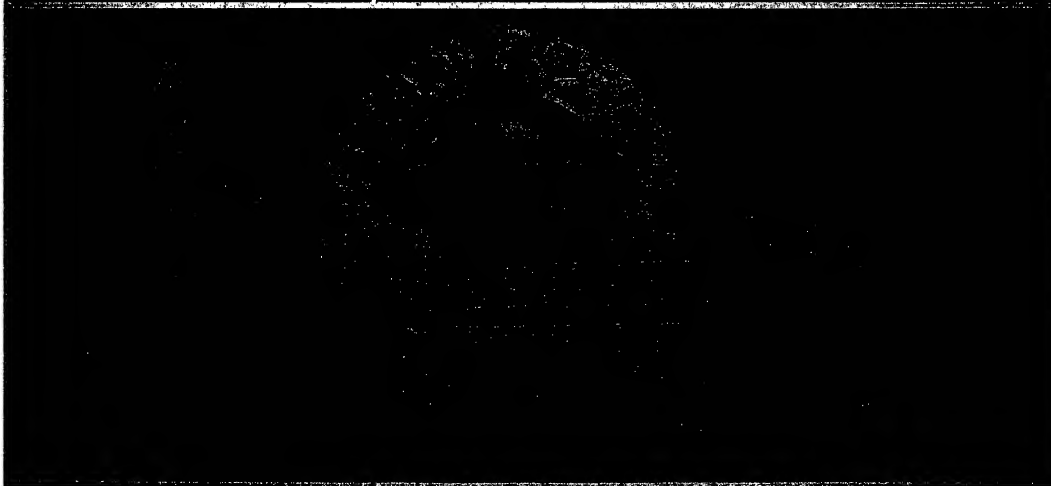
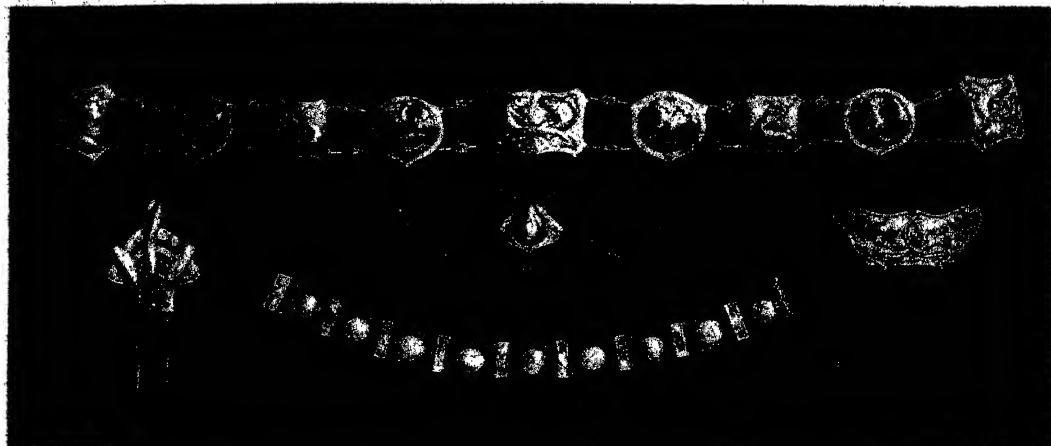
The carving of wooden toys is often done by invalids, and those with very little or practically no training, as the outlines are quite crude, and very little detail is required.

This is not, of course, art. There are wooden beads, carved in quaint designs. There are toys and animals which are always popular. Some are whole animals, in the round, and some are cut in silhouette, mounted on stands and painted, while others are from flat pieces of wood and have movable legs attached on a pivot. This form of carving is not very remunerative, except for those who are unable to do anything else, and so are satisfied with whatever they can earn.

There are also wooden boats and shapes which fit into each other and are brightly coloured like the Russian toys. They are enamelled or painted to make them more attractive and saleable.

Wood-Carving as an Art

In wood-carving as an art, however, if flowers and designs of artistic merit are to be produced, training is a necessity. It is interesting to note that carving in wood is



just the opposite of modelling, where the form is brought out by building up of the plastic clay to the proper contours, whereas in wood-carving the material is removed to bring out the form of the design. This requires great exactness on the part of the worker, because a piece of wood once carved away cannot be replaced.

Wood-carving requires any amount of

In order to achieve this, a feeling for movement is necessary; for wood-carving, of all things, immediately looks stiff and artificial if it lacks this vital quality. A knowledge of design, an understanding of balance, depth, light and shade are absolute necessities, for around these centres the whole technique of wood-carving.

The wood-carver must have, as well, very

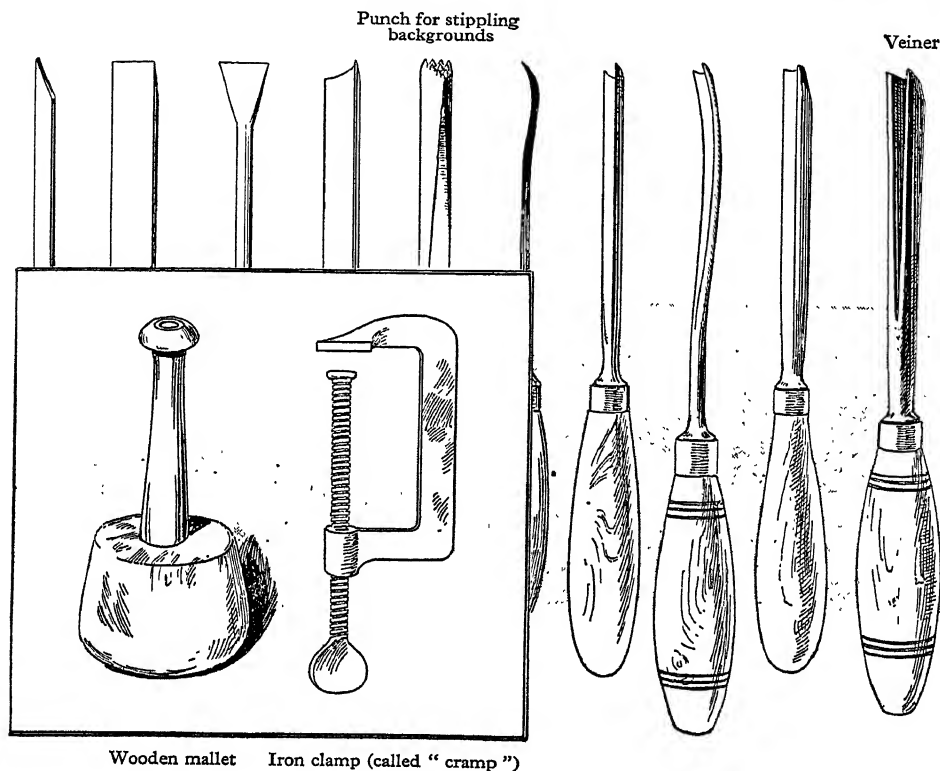


Fig. 105.—Some Wood-carving Tools

patience. There are pieces of work which the wood-carver can point out as having taken hundreds of hours to produce—sometimes years to finish.

Characteristics of Good Work

The achieving of good effects depends upon the conception of clean-cut lines which the hand carries out with the aid of the tool. Individuality of style is necessary, and originality, to make the work distinctive and interesting. Wood-carving must look "alive".

supple hands and wrists, as much of the carving is done from the wrist. A strong left-hand grip is used for holding the work, and the right hand must be strong, and, at the same time, capable of a very light touch for finishing.

Training and Equipment

The training depends upon the learner's knowledge of design, and drawing ability. With both of these, training for wood-carving might take anywhere from six months—in

the case of very exceptional pupils—to three years, spending many hours a day in practice.

There are, perhaps, a dozen tools necessary: chisels, gouges of various depths, a mallet, and clamps. Each worker has his own way of attacking the elaborate pieces. The design is first very carefully worked out on paper in minutest detail, then traced upon the wood. The background is then formed, the carver cutting down so as to have a base to work from. Then the outline round the design is perfected and cut clear and clean, after which the carving is carefully done so as to produce the proper effect of relief, and a good balance of light and shade.

As a Source of Income

The artist in wood-work may not find her profession very lucrative when commissions are few and far between, and many hours of patient labour have to be expended on each piece of work. She can, however, employ her art in more profitable ways by producing novelties for daily use, such as umbrella and parasol handles of original design, cleverly coloured and tinted. Boxes for chessmen are marketable, as well as trinket boxes, needlework boxes, and other useful articles. The important thing for the worker is to try to adapt her products to the public taste and demand, and meanwhile to produce, in her spare time, the larger pieces of real merit which are the ambition of every true artist.

Marquetry Painting

True marquetry is a kind of inlaying with various woods, the designs being marvellously delicate, considering the nature of the material. Marquetry painting is an imitation of the older art; when well done it can hardly be distinguished from the original.

Kauri pine, sycamore, and other so-called "white woods" form excellent backgrounds. This method of decoration can be applied not only to blotter-covers, caskets, and frames, but also to larger articles, such as

furniture, spinning-chairs, chests, table-tops, screens, and trays. The designs vary according to the age and country of the marquetry imitated. Here novices often go astray, putting Dutch patterns on copies of Chippendale furniture, and so on. Such errors can be avoided only by study and experience, or by working from reliable designs. Whether, as is usually the case, musical instruments or arabesque ornamentations are portrayed, it must be remembered that in no case is a raised effect required, so that shading and veining are sparingly introduced.

Materials

The wood-stains used for marquetry painting are water-colours, scentless and cleanly to handle. Satin-wood, rose-wood, mahogany, walnut, ebony, and olive are among the tints employed, as also are red, blue, and yellow. By combining two or more stains other shades can be obtained, but the entire quantity required should be prepared at once, as a second mixture is seldom exactly similar to the first. The other essentials are: Medium for thinning the stains when necessary, preparing-solution or size for dressing the wood, polish for the completed work, a tube of lamp-black or ivory-black paint, some sandpaper, camel-hair brushes, and paint palettes.

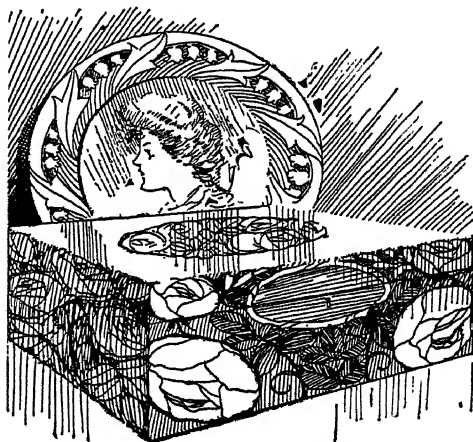


Fig. 106.—Articles decorated with Simple Marquetry

MARKET GARDENING

Market gardening may be an exceedingly profitable occupation for the woman who possesses a large garden and a love of horticulture. Also, she must have both knowledge and experience, in order to be able to enter into competition with others and yet command prices which will make her work profitable. In short, she must aim to bring on fruit, flowers, and vegetables so that they are ready in advance of the general season, and can therefore command luxury prices.

In these days of specializing, the market gardener would do well to concentrate her energies on a few subjects for each season only. She may raise early peas in spring; cucumbers for May; forced tomatoes—before they ripen out-of-doors, in summer; particularly fine fruit, of two or three varieties, in autumn; and hot-house flowers during the winter months.

Finding a Market

She must then find a good market for her produce, either locally or by sending it to town. If it has to be sent away to a distance, then the greatest care must be taken in packing the produce so that it may retain all its freshness. It should be picked and packed so that no single article can be damaged in transit, and the produce will arrive as fresh and as attractive looking as when it was packed.

The Ministry of Agriculture publishes many leaflets dealing with the cultivation of vegetables and fruit, and is ready to send these to anyone needing such assistance.

Fruit under Glass

Whilst such fruits as apples, pears, peaches, and autumn grapes can only be grown at a profit by the most experienced gardeners and under favourable conditions, others, such as tomatoes, early grapes, early strawberries, peaches and nectarines, can be made to pay well. Span-roofed houses or frames constructed to catch all the sunshine possible in winter, and with sufficient artificial heat at command, are essential to

success. Tomatoes are perhaps the easiest to manage, and most profitable, the British fruit being always preferred to the foreign. For early fruit, seeds should be sown in heat in November, and the plants grown in a light position in a temperature of 55° to 60° F. When properly managed, they should yield a first crop in May.

Grapes require a house to themselves if they are to be forced to ripen fruit in June; they should be planted in inside borders. They need skilful treatment, and therefore their cultivation should not be attempted unless experienced labour is available. Late grapes are much more easily grown, and if properly ripened they will keep well into the winter. The best sorts for market purposes are—*black*: Black Hamburg, Gros Colman, Alicante; *white*: Muscat of Alexandria, Buckland Sweetwater, Trebbiano. Probably the most useful and safest grape for an amateur is Black Hamburg.

Figs are not difficult to manage, and where space is limited they may be grown against the walls of lean-to houses. If grown in pots they require rich treatment, and plenty of heat when forced.

Strawberry Culture

Strawberries grown in pots in the open air, and brought into a house or frame to be forced, are usually profitable. The runners should be potted in August in 5-in. pots, and stood on a coal-ash bottom till November, when they are safest in cold frames. In December they may be taken into a house kept at a temperature of 45° to 50° F. till the flowers push, when the temperature should be a few degrees higher. When the fruit is forming, a weekly dose of Clay's fertilizer may be given. Care in ventilation and watering is necessary. The best sorts for forcing are Royal Sovereign, Sir J. Paxton, and La Grosse Sucre.

Carefulness in gathering and packing is essential to the securing of good prices in the market for all fruits; it is therefore worth while to learn thoroughly how to harvest

and pack fruit for market. Too little attention is given to this matter by British growers.

Vegetables

Green peas are well worth cultivating. The ordinary greengrocer recognizes only about a month as the green-pea season—from the third week in June till the end of July. Before the former date they are “not in”, and after the latter they are “all over”. But the practical gardener knows that, with a little management, a supply may be had from the first week in June to the middle of October.

Many gardeners sow a few rows of early peas on a warm border facing south at the beginning of November, and if the weather remains fairly mild they speedily come up thick and strong. Some succeed by starting the seed in shallow boxes and transplanting the seedlings into the open ground when they are about 4 in. high. Severe and protracted frost and snow sometimes kill them, but they frequently survive even a hard winter, and come into bearing earlier than any others. By drawing up the soil on each side of the rows, so as to form a protecting ridge, the young plants have a better chance. Those, however, who do not care to run any risk will do very well by sowing in mid-February or early March, and going regularly on at fortnightly intervals. The best sorts to grow are—*Early*: American Wonder, Gradus, Ringleader; *Late*: Ne Plus Ultra, Culverwell's Giant, Stratagem.

Salads for Market

Salad-growing is another profitable branch of gardening, but it must be done with intelligence. “All the Year Round” is an excellent sort of lettuce to grow. Considerable breadths of them should be sown at about fortnightly intervals, for they are good at all times. They may be grown in frames all the winter, and if well managed and carefully packed they fetch good prices.

Some gardeners sow quantities in shallow boxes at the approach of winter, and place them under glass. When the leaves are large enough to have their distinctive flavour, they are cut for mixture with other salad

herbs without waiting for them to form hearts. Other less well-known varieties of salads are described on pp. 50–1.

Shallow boxes of cress should be sown weekly, the seed just scattered on the top. The box, covered with a piece of board, may be placed on the greenhouse floor. The seed germinates rapidly, and in a few days white stalks and yellow leaflets about half an inch high appear. The boards should then be removed and the box brought into the full light, and in three or four days the cress will be fit to cut. Mustard grows even more rapidly under the same treatment, and if both are to be used together, the cress should be allowed double as long as the mustard or rape, which is the so-called “cress” of the shops.

Other Profitable Vegetables

Parsley is in continual demand, and in hard winters is remunerative. April and August are the best months in which to sow it, the late crop requiring protection from frost. It is also worth while to have some large boxes of it. Mint forces well in boxes on the floor of a greenhouse, and there is a strong market for it when early lamb makes its appearance. Radishes grown in frames are a paying crop when marketed in April.

French beans are easily grown in frames, or planted in boxes or pots to be placed in houses to fruit; with a little care they can be had in fruit almost all the winter. If cucumbers are to be profitable they must be in the market as soon as salmon is in season. Later they are so plentiful as to be worth little, unless they are sold privately by grower to consumer.

Asparagus and sea-kale always bring good prices, especially the former, which is sold in bundles of 50 or 100 sticks. Sea-kale should be white (see p. 49). Chicory may also be grown as a substitute for sea-kale. It is growing in favour as a British dish.

Fruit for Market

Orchard fruit, cherries, pears, apples, plums, damsons, filberts, and cobs are perhaps most profitable when sold on the trees to a dealer. He sends his own ladders,

men, and baskets, when the fruit is fit for market, and it is gathered and packed without any trouble to the seller. If there are any apples that repay private gathering and storing, they are Ribston, Cox's Orange Pippin, and Blenheim Orange, for which high prices may often be obtained in December. There is also a good market for early apples, such as Duchess of Oldenburg, Irish Peach, Stirling Castle, and Beauty of Bath. These are ready in August, when apples are not to be had from the ordinary sources.

Dealers are observant of crops, and if they see large strawberry beds or a considerable number of raspberry canes and black-currant trees, they are very likely to call in summer, and inquire if there are any to spare. In this case it is sometimes more convenient to sell to them than to employ outside labour in picking.

In laying out a garden for profit, it is much wiser to plant bush and standard fruit-trees than any others. They do not shade and keep the sun off other things; they come very early into bearing; the fruit is extremely fine, and may be gathered by anyone without the aid of steps or long ladders.

Flowers for Marketing

Growing flowers for sale is, to a great extent, a winter occupation. In summer flowers are so plentiful that little, if any, profit can ordinarily be made out of them, though there are a few nursery-men who make a speciality of sending boxes of flowers by post from 2s. and upwards, and do a fair amount of business with private customers in large towns. The kinds they cultivate for this purpose are chiefly carnations, roses, and sweet-peas.

There is always a certain demand for home-grown flowers about Christmas, and afterwards until the beginning of Lent, as there are then a good many dinners and dances. Nothing pays so well then as roses, provided they are of good shape and clean, that is, not infested with green-fly. Stephanotis, or Cape jessamine, is also very popular, and a good house of this lovely and fragrant

white flower is a valuable property, but one that takes a few years to bring to perfection. Lilies of the valley, either for cutting or in pots, which always command a good price in winter, force well.

Gardenia, very late chrysanthemums, Roman hyacinth, eucharis, white azalea, arum lily, and camellias are good plants to grow for a supply of white flowers for church decoration for Christmas and Easter. Red flowers may be obtained from rhododendrons, azaleas, camellias, forced hybrid perpetual roses, and tacsonia. A few large yellow daffodils are always worth putting into heat for early work. Tree and herbaceous peonies are also worth forcing for church decoration.

Violets are Profitable

Violets are well worth growing for profit, the best kinds being—*double*: De Parma, Marie Louise, Neapolitan; *single*: Princess of Wales, Russian. They should, if possible, be grown in cold frames close to the glass. To ensure quantities of flowers, young plants must be put in thickly every year early in August. Frames previously used for cucumbers do very well for the violets. Old matting, carpet, or straw put over the glass in severe weather is all the protection needed. When the blossoms are over, the plants should be divided and put out in the open ground in a shady situation. Those that are not wanted need not be thrown away. A short advertisement in a gardening paper, offering them at so much per dozen by post, will in all likelihood bring in plenty of prepaid applications for them.

Gardenias and Orchids

White gardenias, which so many people now prefer to camellias, require stove heat, and are rather difficult to manage, though, when they like their position, and have exactly the right treatment, they bloom profusely. Good flowers in winter and quite early spring sometimes fetch as much as 4*d.* each, and even more.

Some cool orchids are easy to grow, and occasionally a good sum may be realized from their flowers. The best kinds to grow

for this purpose are *Odontoglossum crispum*, *O. Pescatorei*, *O. grande*, *Cypripedium insigne*, and *Cælogyne cristata*. The blossoms last a long time in water, and unless absolutely crushed or torn to pieces they may be remounted and worn over and over again. At first hand each orchid, if of good quality, is worth a considerable price.

Bulb Cultivation

The cultivation of hardy bulbs, such as daffodils and tulips, may bring but small profit, but the returns are quick. It is most economical to cultivate them under trees, in an orchard for instance, because they are quite over before the fruit makes much show. The cut flowers always sell, and fresh bulbs form so rapidly from the parent ones that they speedily make a little stock-in-trade, while the old bulbs are all the better for the removal of the offshoots. Gladioli are now largely used for room decoration, and, as there is a great variety of colours and the bulbs are cheap and easy to manage, it ought not to be difficult to find a good market for the flower spikes.

Seeds

Those who wish to make a speciality of seeds must be very exact and methodical. It is of the greatest importance that they should be kept pure and true to name (see *Seed Harvesting*, p. 33). The owner of a particularly fine white or red sweet-pea, for instance, must mark the blossoms and watch for the seed, and take the greatest care to keep them separate from the seeds of other sweet-peas. Some growers sell selections of six or twelve kinds, containing a little marked packet of each colour, at prices varying from 3s. 6d. to 5s. 6d.

Exactly the same applies to pansies and

violas. Pure whites, bright yellows, and well-defined blues are highly valued for spring beds and borders, but the colours must be distinct.

To preserve and sell the seeds of ordinary vegetables requires a large space of ground, and few owners of gardens can do more than save and store enough seeds for their own use in the following spring. There are some things, however, of which one buys very few seeds for sixpence, though they are plentiful and always saleable if known to be of a good and reliable strain. Chief of these are cucumber, vegetable marrow, and tomato. Each ripened fruit contains a quantity, and if carefully dried, and sufficiently watered when sown, very few fail, and that can hardly be said of bought seeds. Probably that is because the temptation to mix old seeds with new ones is strong, and very few keep their power of germination beyond the first year.

Breeding New Varieties

The breeding of new varieties of plants has now become an important and lucrative branch of gardening. Specialists in daffodils, auriculas, pansies, carnations, and chrysanthemums, among flowers, and in potatoes and apples, have had remarkable successes in breeding new sorts which sell for high prices. The art of crossing, selecting, and fixing new varieties is a fascinating one, requiring much knowledge and painstaking effort. Breeders of orchids have obtained as much as £1000 for a single hybrid. Breeders of potatoes have scored almost equally well. New varieties may be entered at horticultural shows.

Poultry-Farming for Profit

See *Farm Poultry*, p. 114.

THE DAIRY

Construction of Dairy

The dairy should be kept exclusively for the handling of milk, cream, butter, and for the storage of dairy produce generally. On no account should vegetables, meat, or fish be kept in it. As milk readily absorbs foreign odours, the atmosphere must be perfectly pure if taints are to be avoided. The dairy should be kept as cool as possible. To effect this, the building should have a northern aspect, the walls being constructed

trapped outside the building. The shelves should be of marble, slate, or stone.

Windows, made to open, are essential, and these should be covered with perforated zinc, so as to ensure a thorough draught and to exclude flies. A good supply of pure, clean water is absolutely necessary.

Dairy Utensils and Appliances

The utensils ordinarily used in a dairy are: covered milk pails, milk strainer, milk cooler, one or two shallow pans, a separator, pas-

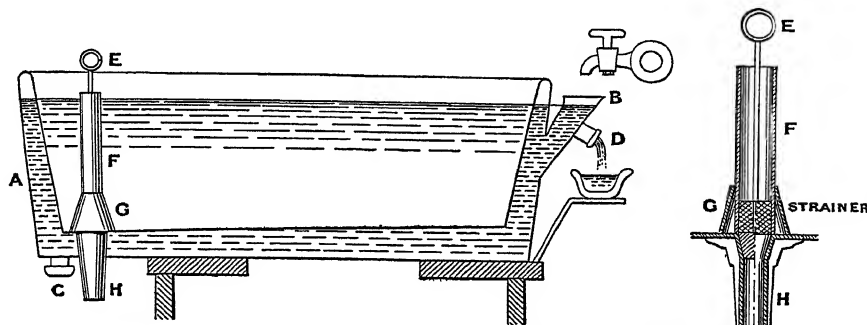


Fig. 107.—Section of Jersey Creamer (with lid removed) and Enlarged Section of Plug

A, Double-cased vessel. B, Water inlet. C, Water outlet. D, Water overflow. E, Plug fitting into pipe F, which is fitted at the bottom with a strainer of fine wire gauze, protected when in use by the ring G (which is removable). Pipe F rests within the fixed pipe H, through which the skim milk is drawn off.

on the hollow brickwork principle, and the space between the ceiling and the roof made as large as possible to act as a barrier to the heat rays. The use of light-coloured slates and the insertion of tarred felt below the slates will further help to keep the dairy cool.

The inner aspect of the walls may consist of white enamelled brick, or be faced with white tile, or have a smooth cement surface, white enamelled. The floor should be impervious to moisture, with a smooth surface (enabling it to be easily cleaned), and a slightly raised centre to facilitate drainage; if made of concrete or granolithic cement, there will be no crevices in which milk or dirt can collect. All internal drainage should be surface drainage, and the waste discharged into a closed drain which can be

teurizing can, enamelled pails, steel pails, churn, butter-worker, Scotch hands, printing dies, scales, thermometer, butter muslin, straining cloths, butter-crock, butter-milk drum, and scrubbers. The scrubbers, deck-brushes, and cloths used for cleaning should be reserved entirely for the dairy.

Care of Dairy Utensils

Immediately after use, all dairy utensils must be effectively cleaned and sterilized. A regular routine should be followed. First wash the vessels thoroughly in lukewarm water containing some cleansing agent, such as washing soda or soap powder, then rinse them with an abundance of clean hot water, and finally plunge them into scalding water, allowing them to remain there for three minutes. This procedure will ensure

sterilization and rapid automatic drying of the utensils. After treatment, the dairy utensils may be exposed to the sun or left in a current of fresh air.

Cleaning of the Dairy

The dairy should at all times be kept well ventilated, as a damp, stagnant atmosphere induces mould growth, and is a frequent source of taints in milk and bad keeping qualities in butter. The floors should be scrubbed each day with soapy water, and thereafter flushed with boiling water and rendered as dry as possible by the rubber squeegee. To facilitate the drying of the floors, the doors and windows should be opened so as to encourage a through draught. All taps and brasses must be cleaned daily, and metal vessels kept brightly polished at all times. Woodwork should be scrubbed with warm soapy water and scalded with hot water. Drains should be disinfected once a week with formalin or chloride of lime, and at least once a year the dairy should be fumigated.

Dairymaid

The dairymaid should be intelligent, clean, industrious, and an early riser. She should wear a plain washing dress, a strong white apron, a white cap completely covering the hair, and strong leather boots. She should take the entire management of the dairy and milk, and clean all utensils. The feeding and management of the cows, which is usually entrusted to the farm department, should, however, receive her careful supervision.

No dairymaid — however efficient — can produce a good flavoured cream or butter from tainted milk. Milk for consumption or conversion into dairy products should be produced under strictly hygienic conditions. The wiping of the cow's udder and flank with a damp cloth just before milking, the washing of the milker's hands before milking each cow, the rejection of the first few streams (fore-milk), and the use of sterilized utensils,

are factors of supreme importance in the production of clean milk. No colostrum, old milk, or milk in any way abnormal should be used for making butter or cheese; the fresher and purer the milk, the finer will be the flavour and the better the quality of the finished product.

Care of Dairy Produce in the House

When milk is received from the cowman it should be strained at once through a gauze strainer, over which a fine muslin should be fastened. Never allow it to stand in the vessel or pail. After being strained, the milk should be chilled by the milk cooler or "refrigerator", and kept in as cool a place as possible. If a cool room is not available, a wire safe hung in the open air is an excellent place to keep milk or butter. Every jug, bowl, &c., in which milk is kept should be carefully washed, and scalded with *boiling* water after using, then well cooled before again using.

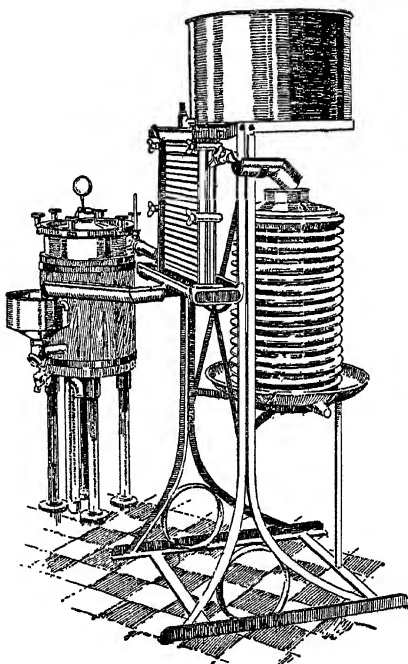


Fig. 108.—Complete Pasteurizing Plant

BUTTER-MAKING

Setting the Milk

Butter may be made either from whole milk or from cream; the latter is the commoner and more convenient method, the cream being separated from the milk either by gravity or by means of the centrifugal separator. When the gravity system is employed, the milk is strained into shallow pans or double-jacketed vats and left undisturbed until creaming is complete. To facilitate the rising of the cream, the temperature of the dairy should be kept relatively low; from 50° to 55° F. would represent good working conditions. Cream separates out more readily from milk when the temperature of the latter falls gradually. Hence it is better to set the milk to cream as soon as it leaves the cow, and while still approximately at the body temperature, viz. 98° F., and to allow it to cool gradually to the temperature of the dairy. Creaming is complete in from twenty-four to thirty-six hours. The cream is removed by means of a perforated skimmer, as little milk as possible being taken with the cream. Such cream will contain on an average about 30 per cent butter fat.

Cream Separators

From the point of view of the butter-maker, much better results can be got by the use of the separator. Small hand-driven machines, obtainable at a reasonable price, are well adapted for use in small dairies where the produce of only two or three cows is handled. The increased gain in cream and butter will soon repay the initial cost of the separator. The advantages of a separator are many: the cream and the skim are obtained in a perfectly fresh condition; many impurities in the milk are removed in the course of separation; less space is taken up in the dairy; and the labour of cleaning a large number of shallow pans is obviated. The work is very rapidly done, as a small machine can separate 20 gall. in one hour. The separation of the cream is

almost perfect, from 96 per cent to 98 per cent of the fat being recovered, whereas when shallow pans are employed, only from 80 per cent to 85 per cent of the fat appears in the cream.

A separator should be kept clean and well oiled, and run at the uniform speed recommended by the manufacturers. Milk should



Fig. 109.—“ Alpha Laval ” Separator (Cream Screw)

be separated as warm as possible, and always above 85° F. If the milk is separated cold, a considerable portion of the fat is left behind in the separated milk. Milk which has fallen below the temperature indicated should be heated up to 100° F. before separating it. Where only a few cows are kept, it will be necessary to gather the cream from several milkings, until enough has been obtained to give a satisfactory churning, i.e. anything above 2 lb. of butter. To churn less than this is scarcely worth the expenditure of skilled labour.

Pasteurized Butter

The finest quality of butter is made from pasteurized ripened cream. Cream for butter-making is pasteurized by heating it to a temperature of 160° F. for fifteen minutes, and then cooling it down to the ripening temperature—60° to 70° F. On a small scale, the operation may be performed by immersing the vessel containing the cream—enamelled pail, pasteurizing can, or steel drum—in hot water and stirring the cream until the desired temperature has been reached; the cooling is effected by circulating cold water round the container. Pasteurization is thus simply a method of purifying the cream; it destroys most of the germs which commonly occur in milk, and especially those which cause taints in butter. Pasteurization helps to get rid of many of the difficulties of butter-making, and makes it possible for the butter-maker to produce a very uniform article throughout the year.

“Ripening” the Cream

If the pasteurized cream were churned direct without any further treatment, the resultant fresh butter would have a very mild and almost insipid taste. To produce the desirable flavour, the pasteurized cream is subjected to a preliminary souring process known as *ripening*. As the lactic acid germs which ordinarily cause the souring or ripening of cream have been destroyed by pasteurization, it will be necessary to replace them at this stage in the form of the *starter*. A starter is simply a very pure sour milk; indeed buttermilk will serve as a starter if it is fresh and has a mild, pleasant flavour and is free from any bitterness. But it is better to use a starter of high quality obtainable from a Dairy Institute.

To maintain this pure culture starter in an active and vigorous condition, a portion of the original material is added to freshly pasteurized milk (at a temperature of 70° to 75° F.) in a clean milk-bottle or enamelled pail. The milk, if kept at room temperature, will thicken in twelve to eighteen hours, and is ready to function as a starter or souring agent at the end of this time.

Starter should be inoculated daily. The quantity of starter required to ripen cream in twenty-four hours is from 3 per cent to 5 per cent, or, approximately, $\frac{1}{4}$ to $\frac{1}{2}$ pint per gallon of cream. The cream to which starter has been added should be kept at a temperature of 60° to 65° F. until it has soured. This usually takes place in eighteen hours or less. At the end of this time, the cream is cooled down to a few degrees below the churning temperature, and so held until the operator is ready to churn. During ripening,

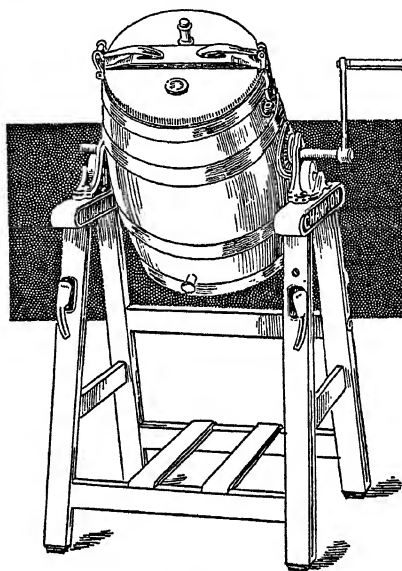


Fig. 110.—“End-over-end” Churn, with Lever Fastenings

the crock or ripening vessel containing the cream should be covered over with a clean muslin cloth.

The Churn

The churning should be done early in the morning, especially in summer, and the whole process completed in two hours. Churns should be made of hard impervious wood to give the maximum amount of concussion and be easy to clean. The best type to use in a small dairy is the “end over end” churn. This form is cylindrical or barrel shaped in appearance, and is constructed of oak. The churn is operated by a handle, and is mounted on a rigid wooden frame or

stand. The churn should be prepared as follows: Rinse it with lukewarm water, scour the interior vigorously with salt, scald with boiling water, and then rinse with clean cold water. Lastly, leave the churn standing about one-third full of water at the churning temperature for about ten minutes.

Temperature for Churning

The ripened cream is now adjusted to the correct churning temperature by the addition of thinning water, or by immersing the pail containing the cream in cold or lukewarm water as required and stirring the contents. The temperature of churning is a most important point; the standard temperature is 56° F. in summer and 60° F. in winter. Always use a good thermometer, and allow it to remain in the cream for at least a minute before reading. One or two degrees above or below the normal temperature of churning has a profound effect on the time of churning and on the grain. Too high a temperature will result in a quick churning and in a lumpy, greasy butter which has no body and keeps badly. A low temperature means a prolonged churning, and if the churning temperature be even four or five degrees below the normal, it will practically be impossible to churn the butter in less than two hours.

The cream is strained into the churn through a coarse straining cloth fastened over the mouth of the churn; small curdy particles which would cause white specks in the finished butter are thereby removed. Colouring matter, if required, is added at this stage; in summer, when the cows are at pasture, no colouring is needed, but in winter, when the butter fat is normally white, the addition of 1 teaspoonful of liquid annatto to every 2 gall. of cream is required, or as much as will give the standard "June" colour—a pale straw shade. Avoid over-colouring the butter.

Churning Process

After the addition of the cream to the churn and the mixing in, if need be, of the

colouring matter, the lid is fastened down and churning commences, slowly at first, and then with increasing rapidity till about 40 revolutions per minute are reached. During the first few revolutions the relief valve or "ventilator" is pressed frequently to allow of the escape of "gas"—which is mainly water-vapour under pressure. When churning has progressed for about fifteen to twenty minutes, the formation of butter will have commenced. This is evident by the observation glass or window in the lid of the churn becoming clear. The cream is said to have "broken". At this stage a small quantity of cold water, called "breaking water", two degrees below the original churning temperature is added to the churn contents, and churning is then continued until the grain has fully formed.

Working the Butter

Great care has to be exercised at this stage of the churning to avoid lumps. If churning has been properly done, the butter will appear in the form of uniform grains, about the size of wheat or sago, a few minutes after the addition of the breaking water. Churning is now complete; the butter is allowed to run off through the plug-hole into a pail over which a strainer is placed to catch any particles of butter. Water at a temperature of 50° to 54° F. is then added, and the churn revolved several times to wash the butter, and the water run off. It is followed by a weak brine solution (1 lb. salt to 2 gall. water), with which the granular butter is allowed to remain in contact for ten to fifteen minutes. After brining is complete, the granular butter is removed from the churn by means of a perforated wooden scoop, placed on an enamelled plate covered with wet muslin, and taken to the butter worker, which has previously been prepared for use by washing it with tepid water, scouring with salt, scalding with boiling water, and then chilling the wood with cold water. The butter mass is spread evenly over the bed of the worker, and the roller passed firmly over the butter to expel the moisture. The rolled-out butter is immediately brought together again with

the Scotch hands, and the process repeated; usually five or six turns of the roller are required to render the butter dry enough for further manipulation.

Salting

There are two methods of salting butter: (a) dry salting, and (b) salting in the brine, the former being the commoner method.

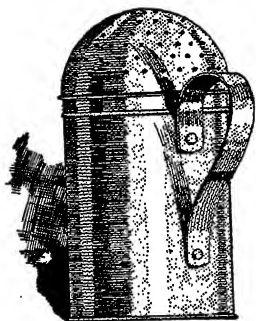


Fig. 111.—Salt-Dredger

When dry salting is practised, the butter mass after the first turn of the roller is rapidly weighed, rolled out again on the worker, and half the required quantity of salt applied from a dredger. The butter is then given another working and the remainder of the salt applied. The butter is brought together and set aside for twenty minutes until the salt dissolves. The working is then completed. Half an ounce of salt per pound of butter is a medium salting; fully salted butter receives 3 oz. per pound.

Butter may also be salted in the churn by a concentrated brine. In this case a good even-sized grain is required; lumpy or greasy butter cannot be effectively brine-salted. The brine is made by dissolving $1\frac{1}{2}$ lb. of salt per gallon of water, and filtering through three-ply muslin. The duration of the steep is thirty minutes. After brining, the butter is worked in the usual way, no dry salt being added.

Making up the Butter

The butter is now ready for making up, which is done with "Scotch hands" (fig. 112) on a board. Throughout the whole

process it need never be touched with the human hands. It should be weighed, made into any shape required, and it then cuts like wax, without holes, and when broken should show a grain like cast iron, the colour being a pale-yellow. It keeps best in a cool, pure atmosphere on a marble slab. Butter travels best when wrapped in grease-proof paper, placed in strong parchment boxes, which are made in different sizes, and can be obtained from any good box-maker.

Potted Butter

Butter so made that it may be kept or preserved for some considerable time is called "potted butter". For the preparation of such butter only the best quality of milk and cream should be used; second grade or stale cream is quite unsuitable. The cream should be pasteurized to a temperature of 170° F. for ten minutes, and carefully ripened at 60° to 65° F. with a good starter to a low degree of acidity—until the cream smells sour but has not coagulated. Churn at a relatively low

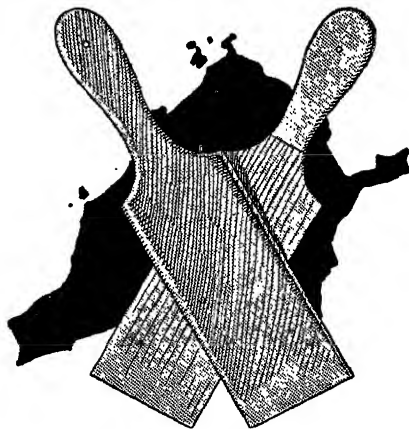


Fig. 112.—"Scotch Hands"

temperature, strive to get a good grain, and wash the granular butter thoroughly until the wash water runs clear. Salt at the rate of $\frac{1}{2}$ oz. per pound, and after firmly packing the butter in the crock—which has been previously scalded—cover the upper surface with sterilized muslin and then with half

an inch of dry salt. Finally, a piece of parchment paper is tied over the mouth of the crock.

Causes of Bad Butter

Though butter-making is not a difficult

the commonest faults arise from neglecting to pasteurize the cream, the employment of a bad starter, under ripening or over-ripening the cream, insufficient washing and working of the butter, or the use of an inferior salt.

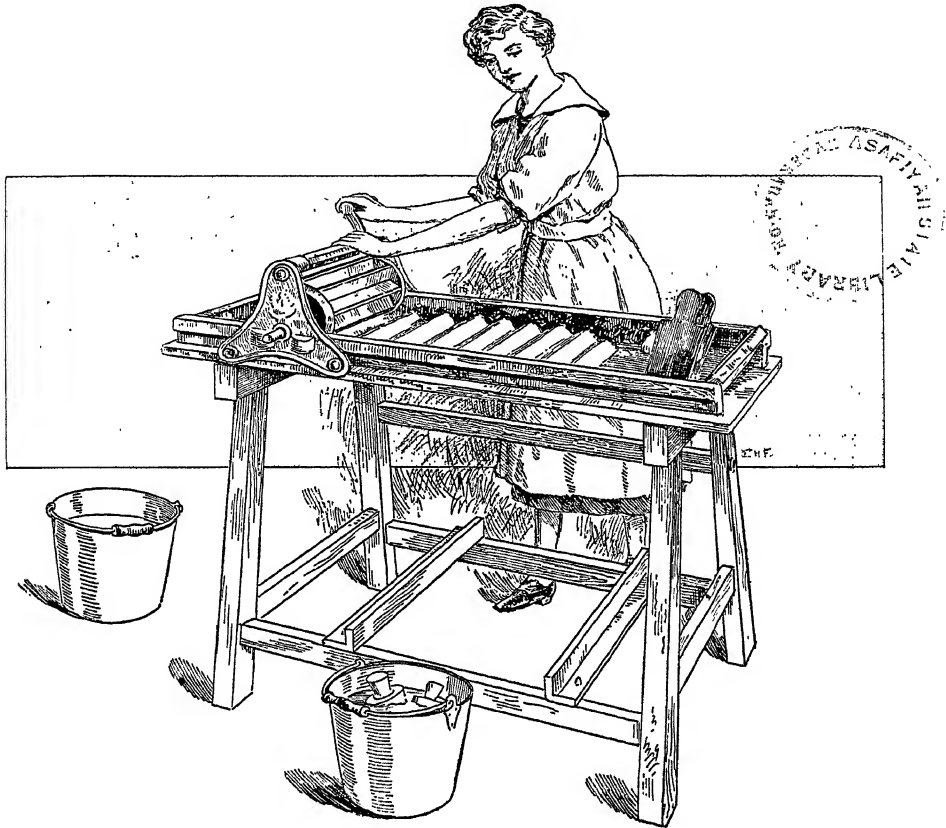


Fig. 113.—Buttermaking

process, yet a good deal of bad butter is produced. The fault lies not so much in the process of manufacture as in the conditions under which the milk or cream has been produced. A contaminated milk, a bad water-supply, food causing taints, faulty drainage or defective ventilation in the dairy, or unclean utensils, are common causes of inferior butter. But the condition of the milk and the state of the utensils more than any other factors determine the quality of the butter. In the process of manufacture,

Streaky or Mottled Butter

Streakiness in butter is a result of defective salting. It primarily arises from the presence of too much butter-milk in the butter, though uneven salting and the use of bad salt will also cause mottling. Butter salted in the brine does not show mottles. To avoid mottling, wash the granular butter effectively, use a good salt, and allow sufficient time for the salt to dissolve before completing the working.

Rancid Butter

Rancidity is commonly caused by the initial contamination of the milk or cream. It is frequently due to unclean utensils, to lack of control during the ripening, to the employment of stale unpasteurized cream, to ineffective washing and working, or occasionally to bad salt. To obviate the appearance of rancidity, the utensils should be kept scrupulously clean and should always be scalded before and after use, the cream should be carefully pasteurized, and a good starter employed.



CREAM CHEESE

Double Cream Cheese

To make this highly appreciated delicacy, perfectly fresh cream is required. The cream is taken off thick, pasteurized and cooled in running water to a temperature below 60° F., and allowed to stand to harden for twelve hours. The old method of draining the cream by hanging it up in a bag is unsatisfactory, as by the time drainage is complete the cream may have developed a bad flavour. The cream should be drained in huckaback towelling or fine linen cloth, spread over a wooden form which is provided with a wooden lid that can be weighted. This form is placed on a slab or shelf, and the whole of the inner surface covered with dry huckaback towelling or fine linen cloth, and the cream poured in to a depth of 1 to 1½ in. The free ends of the cloth are then brought over the cream layer so as to cover

“Sleepy” Cream

Cream which is slow to break or which does not yield butter even after a prolonged churning is said to be “sleepy”. The causes of “sleepy” cream are: (1) a badly ripened or contaminated cream; (2) churn too full (the churn should not be more than one-third full); (3) churning at too low a temperature; (4) the use of milk from cows far advanced in the lactation; (5) the presence of stringy milk, or gas-producing organisms in the cream. The remedies will suggest themselves.

it completely, and the pressing-board placed over it, and weighted with 7 lb. for half an hour.

After an hour's drainage the cloth is opened out and the sides scraped, and the cream reweighted with 14 lb. Thick cream well prepared will drain in six hours. Salt (1 oz. per gall.) is added to the cream before it is set to drain. On completion of drainage the cream is filled into small cylindrical moulds (made of tinned copper, and lined internally with butter paper).

Renneted Cream Cheese

This article is made from thinner cream. The cream fresh from the separator or shallow pan is brought to a temperature of 65° F., and a few drops of rennet added. At the end of eight to twelve hours the cream is lightly salted (1 oz. to 12 lb. cream) and set to drain as in the preceding case.

When drainage is complete (in six to eight hours), the cream cheese is moulded as before.

Devonshire Cream

Pour the evening's milk into an enamelled-tin vessel, and allow it to stand until the following morning (twelve to fifteen hours) so that the cream may rise. Then place it on a copper of hot water, and raise the temperature to 185° F. in twenty-five to thirty minutes. The milk must not be stirred at all. At the conclusion of the scald the cream layer is crinkled, and appears a "blanket" $\frac{1}{4}$ to $\frac{1}{2}$ in. thick. Remove the vessel to a cool place, and allow it to stand until its contents are thoroughly cooled, which will take from twenty-four to thirty hours. The cream may then be removed with a skimmer and placed in a perforated strainer. This must be carefully done to avoid injuring the texture. It will keep sweet for about a week, and even longer if packed in glass jars or bottles, hermetically sealed. The remaining skim-milk has a peculiar pleasant flavour, and will keep sweet for a considerable time.

Small Cheeses

The appliances required for making small quantities of milk into cheese are simple and inexpensive, and consist of the following: making vessel (steel drum, wooden tub with smooth internal walls, or enamelled pail), cheese moulds with board and follower, ladle and cheese knife, draining rack (or milk basin), testing iron, thermometer, measuring glass, rennet, starter, and cheese cloths.

The evening's milk is strained into the pail or making vessel, and cooled by stirring to 70° F. One drop of starter may be added in the evening. Next morning, the cream is stirred down and the morning milk run in. Starter at the rate of 1 oz. per gallon is added to the mixed milk, which should be immediately raised to 92° F. The milk is then allowed to ripen for one and a half hours, being occasionally stirred to prevent the cream rising. The temperature should be maintained at 92° F. throughout; if it falls

below this, it should be brought back by heating a portion of the milk.

On the completion of the ripening process, rennet is added at the rate of 1 dram to 2 gallons milk. Dilute the rennet with cold water and stir for four minutes. When the milk has coagulated, the curd is cut vertically into 1-in. squares with the knife, and ladled out in thin slices into a coarse cloth resting in a draining-rack, or—what is equally good—a clothes-basket or a shallow pan. When all the curd has been ladled out, the corners of the cloth are brought together and lightly tied. As the whey drains away the curd contracts, and the cloths should be tightened every fifteen to twenty minutes. After the third tying it will usually be found that the bulk of the loose whey is expelled, and that the curd has lost its sloppy consistency. With the firming of the curd, the bundle is tightened up considerably and turned over. After twenty minutes the matted curd is cut into 4-in. cubes, which are rearranged and tied up tightly. When the hot iron draws threads half an inch long, the curd is broken by the hand (or milled) into small pieces. The testing-iron is a bar of mild steel (a poker will do in an emergency) which is heated in the fire to a dull black heat. A piece of the curd is applied to the

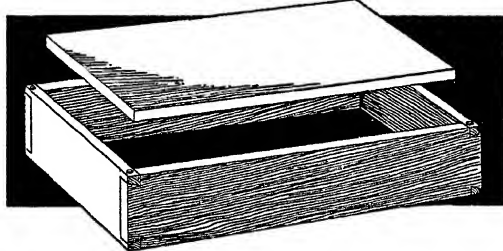


Fig. 114.—Wooden Draining Mould

iron until it adheres, and is then gently withdrawn. The curd is not ready for milling until the operator can obtain threads which draw out half an inch before they break the bracket.

After milling, add salt at the rate of 1 oz. to 4 lb. curd. The salt should be uniformly applied and the curd well stirred to incorporate the salt. Fifteen minutes after

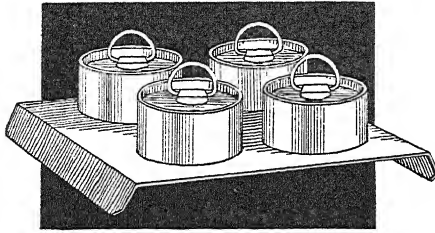


Fig. 115.—Cream Cheese Moulds

salting, the curd is filled evenly into the mould, which has been previously lined with a fine cloth. The follower is then put on, and light pressure applied by a 14-lb. weight. The cheese is turned at the end of three hours and again weighted. In the evening, again, the cheese is removed from the mould, the cheese cloths wrung out in hot water, and the cheese returned to the mould under the pressure of a lightly-weighted lever. Reverse the cheese the next

morning and increase the pressure. Take the cheese out of the press at the end of thirty-six hours or two days, bandage it, and allow it to ripen in a cool room, turning it daily. The cheese will be ready for use in six to seven weeks, and will keep well for three or four months.

The Marketing of the Produce

When there is more milk, cream, butter, or cream-cheese than the family require, there are usually more than enough customers ready to give a remunerative price for it. When this is not the case, it is an excellent plan to send a sample of anything there is to spare to a respectable provision dealer in the nearest town, quoting prices, and assuring him that the quality will always be the same. If the produce is sent punctually, in a clean, attractive form, always up to sample, custom will never fail.

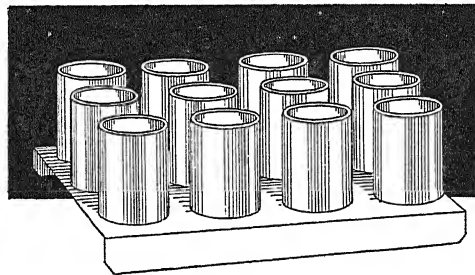
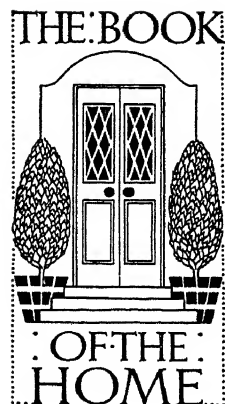


Fig. 116.—Moulds for Gervais

SUNDRY HOUSEHOLD MATTERS



Sundry Household Matters

CHOICE OF PERSONAL CLOTHING

A woman who is conscious of her clothing is never well dressed. The late Lady Randolph Churchill, who was renowned for the style of her clothes, used to say: "While you are dressing, put your mind to it, and do the best you can for yourself. After that, never give your appearance another thought." Some women possess personalities so outstanding that their clothes almost pass unnoticed—unless they strike an unusually discordant note; other women, on the contrary, must rely on their clothing in order to appear to the best advantage; but no woman who is conscious of her clothes is ever well dressed.

Being well dressed consists of wearing clothes which are well cut, carefully made, unobtrusive, and eminently suited to the wearer and the occasion. A woman of taste and refinement instinctively dresses well. A dress or cloak which looks exquisite on its stage wearer may look vulgar and out of place in a small drawing-room. A hat which looks perfect on the head of a beautiful young model may appear to very poor advantage on a woman of different type. So many women make the mistake of buying clothes because the clothes are beautiful, instead of selecting the garments best suited to themselves. There are certain fundamental rules in the selection of dress which are unchangeable, no matter what the fashion. Some of these, briefly set out, may be a useful guide.

Tall Women

Clothes which diminish her height should be selected by the tall woman. If she is

slender, then lines round the body, either at the waist or below the waist, and circular stitching or trimming on the skirt will mitigate the impression of excessive length. Tall women who are also stout should, however, remember that their girth is likely to be more evident than their height, and simple styles should be chosen which accentuate neither height nor breadth.

Short Figures

An effect of height may be achieved by employing long lines from shoulder to hem through the agency of striped materials, or tucks, pleats, or other form of trimming on a self-coloured cloth. These long lines should be broken as little as possible. Any band, whether it be worn at the waist or round the hips should be narrow; nothing cuts the height more than a wide waistband and circular trimmings on bodice or skirt. The short woman who is also slim is easiest to dress. Her figure itself gives the impression of tallness, so that she is able to wear practically any style of dress she pleases. If, however, she be short and stout, most particular care must be taken to select styles which lend height.

Clothes which counteract an angular appearance must be worn by thin women. The neck line and sleeve edges require softening with a filmy material or dainty lace frilling. Loose-fitting garments with horizontal lines to give width are becoming.

Frills and ruffles accentuate plumpness. The beauty of a softly rounded neck and arms is best displayed by severe neck line and sleeve edges.

Choice of Colour

Every woman has some particular colour which suits her best, and if she remains steadfast to this colour, or to variations of it, she may always be becomingly gowned. Instead of doing this, however, many women are tempted to buy a colour because it is attractive to the eye, and they do not think of it in relation to themselves. The result is that neither the gown nor the wearer appear to the best advantage. Remaining steadfast to a particular colour may suggest to some minds an impression of sameness—the idea that one would tire of always seeing oneself in the same colour. By colour, however, a pure unadulterated bright colour is meant, not black or white nor the neutral tints which suit so many women. But the neutral shades may require a touch of vivid colour somewhere, even though it be introduced sparingly in embroidery trimmings, or in a flower or buckle at the waist line or in some other discreet form. This is where the “individual” colour comes in. The blueness of blue eyes is generally heightened by a touch of blue in the gown. Grey eyes are enhanced by most colours which are bright and crude. Brown eyes blend best with colours which possess deep warm tones. The primary consideration in the selection is not the colour of the eyes, but the combined colour of hair and complexion.

Colours for Dark Women

Dark hair, whether it be black or merely dark brown, may be combined with a complexion which is bright and rosy, sallow, or dark and warm-tinted. When there is colour in the complexion, materials which enhance this natural colouring are most suitable. Soft and pale colourings throw dark hair and bright skin into strongest relief; and black is the finest foil of all for a fair and bright complexion, while crude bright colours detract from the natural colouring with which nature has endowed a beautiful skin. Sallow-complexioned women will do well to remember the colours they should not wear before concentrating on those which they can.

Sallowness suggests a touch of yellow in the skin; therefore any materials whose colour is based on yellow, such as amber, orange, and most browns tend to accentuate this. Hues should be selected that whiten the skin by contrast. Black unadulterated may achieve this effect, but it achieves it in a colourless way; some vivid touches must be introduced to lend a note of individuality to the whole appearance. Neutral tints and soft tones cannot achieve it, the colour must be crude and vivid; if a combination of such colours is effected, the individual colour should predominate slightly.

Dark hair combined with a skin which is dark but warmly tinted should be contrasted with shades that help to make the skin appear fairer, even while they enhance its natural colour. Black achieves this, and so do many colours in neutral tints. Dark-haired women, most particularly those whose skins are dark or sallow, can wear jade green and other bright greens and peacock shades with distinction.

For Fair Women

There is something exquisitely fresh and dainty in a woman with fair hair and pink-and-white complexion. This daintiness must be matched by dainty colours, soft and delicate. Most pale shades suit this type of woman, but one of them in particular will be *her* colour and its choice will probably be indicated by the colour of her eyes. If she is fair but pale, then black will help to bring out whatever colour there may be in her skin, and from among the bolder and cruder hues she may choose the colour which will counteract the insipidness of her natural colouring.

Reddish Hair

Titian red hair with its copper lights, as well as hair frankly red, is generally combined with an exceptionally fair skin; both are thrown into their best relief by unadulterated black. A crude green sometimes provides an equally effective foil, particularly at night, and deep browns and autumn tints may be effectively worn. A combination of colours should be particularly

avoided, unless attention is to be riveted on the gown, rather than on its wearer. A freckled skin, which so often accompanies reddish hair, is by no means unattractive.

White and Grey

The complexion of a white or grey-haired woman must determine her most appropriate colour. Only if she be young, tall, and slender, can the white-haired woman afford to dress in striking colours; neutral colours and neutral shades will generally be found to offer the best selection, while black, unrelieved, is liable to look funereal, unless worn with a brightly coloured complexion.

Choosing a Hat

The *right* hat is so potent a factor in dress, that it may entirely counteract the effect of an ill-chosen, ill-fitting, or even dowdy gown. In order to achieve this, however, the hat must be so perfectly chosen that it seems to belong to the wearer, as a well chosen frame completes and enhances a picture. In the choice of hats as in dress, type must dictate the form. There is a *most suitable style* of hat for every type of woman. She may look well in a variety of shapes, but she will look best in one particular shape only; and on this shape, and variations of it, all her millinery should be based. Tall women who are slender can wear large hats with wide brims in preference to small hats with high crowns, which tend to add to their height. Small faces, even on tall women, are best suited by small hats which fit the head closely and do not hide the face beneath wide brims.

Short women must select hats which do not dwarf them more. Tall hats with high crowns or brims which have an upward turn achieve the effect of height. Large flat hats have a contrary effect. Women who incline to stoutness require millinery which is neat in appearance, because soft floppy lines accentuate excessive width. Very thin women on the other hand cannot wear severe hats, which are likely to increase that appearance of angularity they must take particular pains to avoid. This can only be achieved by millinery which is soft in material and outline.

VOL. IV.

Suitable Trimmings

A hat of becoming shape requires but little trimming; good taste dictates simplicity; and any trimmings should be as good as the wearer can afford. The rules regarding colours given for dress, apply equally to hats. Unless one can afford a hat to go with each coat or gown, hats should be selected so that they can be worn with several garments becomingly. Nor should a hat be ultra-smart in design, unless it is to be worn only occasionally, or for social events.

Spending the Dress Allowance

"Cut your coat according to your cloth" may be a dictum both ancient and hackneyed, but it applies very appropriately to the expenditure of a dress allowance. Almost every lady nowadays has an allowance; and whether it be made by her husband, earned by herself, or set aside out of the weekly household allowance, a definite amount should be determined on, so that it can be expended in such a way that all necessities can be provided for. So many women find it difficult to keep within their allowance simply because they do not stop to think of all the things that it will have to pay for, during the course of the year. It has not merely to cover the cost of new dresses and hats. Boots and shoes are expensive items which must be thought of, stockings and underclothing, repairs and renovations. Because there happens to be a full quarter's allowance at the bank, or in the cash-box, it does not mean that the purchase of an extravagant gown or hat is warranted because it can be paid for immediately and in cash. Long before the next allowance is due, shoes and silk stockings may be needed to go with the dress, and many articles of a more useful nature may be required. The following table of percentages has been worked out to afford a useful guide in the allocating of most personal allowances. If any children's clothing is included, a reasonable sum should be set aside, and the amount remaining can then be allocated to cover all personal requirements.

Best Value for Expenditure

The modern woman does not select her clothing with a view to the number of years she can wear it, as our grandmothers used to do. Fashions change too frequently, and renovations, as a rule, involve as much expense and work as the making of a new garment. The only saving entailed by a renovation is the cost of the material. The large range of pretty and low-priced materials which are now offered, enable most women to buy new dresses more frequently than they used to do, and renovations are made

only with more expensive types of materials. This is the custom among ladies who want to dress both well and economically, but who tire of seeing themselves in the same dress for any considerable amount of time.

Well-made clothes which are discarded in good condition can very often be sold at a fair price through advertisements in good class women's journals, or to wardrobe dealers, and by doing this the wearer feels that she has still some value in hand towards a new gown, whereas the old one continues to serve a useful purpose instead of hanging unused in a crowded wardrobe.

EXPENDITURE OF PERSONAL ALLOWANCE

Item.	Percentage of Allowance.	Notes.
Outdoor clothing.	15	Includes costumes, wraps, and coats.
Dresses.	25	Includes evening, as well as day gowns and blouses.
Hats.	6	This proportion allows for comparatively good millinery.
Footwear.	6	Must allow for indoor, outdoor, and evening shoes.
Stockings.	2½	A fairly large proportion to permit of good quality.
Underwear.	8	This allows for new petticoats, and replenishing stock of woollen and other day and night wear.
Renovations and repairs.	10	Shoe repairs, dyers and cleaners, and dress renovations are expensive.
Sundries.	12½	Notepaper, stamps, fares, gloves, and other small items of dress mount up.
Personal amusements.	10	This provides for theatres, afternoon concerts and teas, and subscriptions to clubs and social gatherings.
Presents.	5	A low figure for birthday, Christmas, and other personal gifts.
Total	100 %	

CARE OF CLOTHING

The life and appearance of a garment depends largely on the amount of care with which it is worn and looked after. Most well-dressed women wear their clothes carefully because they take time to dress. The garments are put on straight, with all the fastenings undone, and they are then care-

fully fastened. When undressing, the woman who takes a pride in her appearance does not pull off her clothes before they are completely unbuttoned or unhooked, nor does she throw them over a bed or chair and leave them lying in an untidy heap for hours at a time. To preserve the life of a garment it

must be kept clean, and neatly and carefully put away. Dirt deteriorates materials as well as being most unpleasant to look upon.

Immediate Repairs

Washable garments should be laundered whenever, and as soon as, they require it (see Vol. II, *Mending*); stains should be removed while they are fresh (see Vol. II, *Cleaning, Laundry, and Repairs*). All loose stitches should be immediately fastened and small repairs carried out as and when they become necessary. Missing fastenings necessitate the use of pins, which is bad for the garment as well as being prime evidence of untidiness. Visiting and outdoor gowns should not be worn at home to work or sit about in, even if they are completely covered with an over-all. Work calls for strenuous action, and the dress, although it cannot be soiled, is being strained in various parts so that it will soon lose its shape. Many materials crush when sat upon, so that even quiet occupations, such as reading or needle-work, may spoil their appearance.

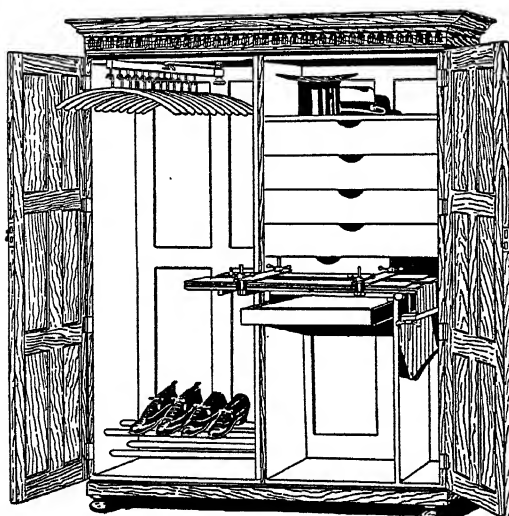


Fig. 117.—Everitt's Patent Wardrobe

Proper Accommodation

To put clothes away properly, suitable accommodation must be provided for every

garment. Dresses and out-door clothes are best hung on hangers in dust-proof wardrobes. Dark and light garments should be separated, as soft light materials are likely to become soiled by proximity with dark outdoor clothing. To prevent this, either a separate cupboard should be set aside for light-coloured and silk gowns, or a portion of the single wardrobe used exclusively for these, with a dividing curtain to separate them from outdoor clothes and dresses in general use. Another good method is to provide dress slips which can be hung over each dress, with an opening which allows the hook of the coat hanger to pass through. All clothes should be aired before they are put away, and woollen materials frequently brushed.

Silk materials, which have been crushed, can be freshened by hanging them in steam—probably over a bath of steaming water—and then letting them dry thoroughly in a warm dry place before hanging away. Hats are best kept on a wardrobe shelf, sufficient space being allowed for each hat; and some hats need to be laid away upside down, in order to retain the shape of a fancy brim. Millinery requires brushing or cleaning frequently, and should, as far as possible, be protected from dust. (See Vol. II, *Cleaning Hints for Personal Clothing*.)

Shoes and Underclothing

Boots and shoes retain their shape longer if put on boot-trees as soon as they are taken off. They should not be worn continually, and cleanliness is a great factor in their preservation, while keeping them in good repair is essential to their appearance as well as shape.

Undergarments are generally kept in drawers, and should always be put away clean and neatly folded; silk garments, especially, deteriorate rapidly unless frequently washed. If several sets of underwear are in use, the freshly laundered set should be put at the bottom of the pile and fresh garments taken from the top, so that all the sets may be worn and washed in turn. All underclothing should be carefully examined and mended before it is put away.

Valeting the Master

A man's garments require just as much care as a woman's, and it is most essential for him to be well groomed for business reasons, if not for others. Several good suits is not an extravagance, because coats lose their shape and trousers become baggy if worn constantly. If possible, the same suit should not be worn on consecutive days. When it is taken off, the trousers should be laid over the back of a chair in their proper folds, and the coat placed on a coat-hanger. Then, before putting it away, the coat should be brushed and hung in a wardrobe on a hanger and the trousers laid in a press. Several

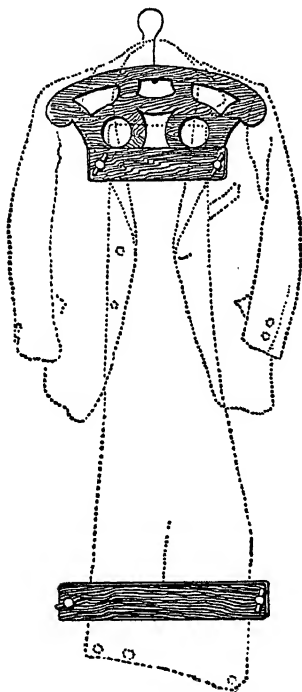


Fig. 118.—Combined Trouser-Stretcher and Coat-Hanger

lighter forms of trouser-presses are obtainable, if the old-fashioned one is considered too bulky. Some of these presses are quite inexpensive, and one is made in the form of a combined trouser-stretcher and coat-hanger (fig. 118).

Periodically, men's suits may be sponged with ammonia and water to remove stains

and dust, and afterwards pressed with a hot iron over a cloth wrung out of water. Ties must be folded neatly and laid flat, or they may be hung over a tape stretched across the inside of the cupboard door and passed under two tapes which are fastened down lower and help to keep them flat.

Men's Underclothing

Shirts must be laid away very carefully so that they are not creased. If the cuffs wear out before the rest of the garment, the shirt can be recuffed. It is best to have this done by the firm from whom the shirt was purchased, so that the cuffs can be matched; or it may be done more economically at home, if a suitable material can be obtained. Underclothing must be carefully examined and mended before it is put away, and should be set in neat piles in a drawer, or on a sliding shelf where it is easily available. Plenty of clean whole pairs of socks must always be ready for use, and they should be mended with silk or wool, matching them as closely as possible so that the darns will be unobtrusive.

Collars must be spotless, and should therefore be put away in a collar-box immediately they are returned from the laundry. To ensure all the collars being worn in turn, the collars in the box must be taken out and given the inside place after the fresh collars have been put away.

Wardrobes and Tall-Boys

A place should be provided for toilet accessories where they are handy, and keep fresh and clean. The most convenient piece of furniture for men's clothing are tall-boys, fitted with sliding shelves on one side and a short hanging wardrobe on the other. Some of these are fitted with a special place for everything—patent trouser-press, boot-rack, and expanding coat-rack, &c.

Suitable Conditions for Storing

With the change of seasons, all clothing which one dispenses with for the time being should be carefully cleaned and stored away under suitable conditions, in order that it may be preserved until future service is

required of it. Cleanliness of the article is important, as dirt and dust are breeding-grounds for moths; thus heavy materials and woollens should be shaken and brushed thoroughly, and, if possible, washed, before storing. Suitable temperature should be maintained when storing goods, avoiding damp, which causes mildew stains to form on the material, and excessive heat is an encouraging tendency for the development of moth.

Storage of Winter Things

All *woollen clothing* should be wrapped in paper, dust-sheets, or dress-bags before storing, and an extra precautionary measure taken by adding some strong-smelling substance such as naphthaline, turpentine, or oil of lavender, between the folds. A cedar-lined chest is the nicest thing for storing blankets and other woollens. *Furs and fur coats* require storing in a cool place, and frequent shaking and beating with a cane on the right side during storage. Carbon balls suspended in muslin should be freely used to prevent moths from laying eggs in the fur. *Winter coats, skirts, and dresses* should be well brushed, sponged to remove grease spots if necessary, and suspended from coat-hangers in long dress-bags.

Men's suits and winter coats must be well brushed, trousers put in a press for a short time before storing, and on removal, carefully folded with "moth preventative" between the folds, and the whole tied up in a clean sheet. *Winter sports boots and leggings* should be stored away on boot trees, rubbing some vaseline into the leather, to keep it pliable, as the constant dampness to which they are subjected during use is liable to make the leather crack.

Exterminating Moth from Clothes

Bake in a moderately hot oven, if possible, to kill the insects, or shake well out of doors and sponge over with benzoline containing as much naphthaline as will dissolve in it. Hang out of doors for a long time.

Stained Wearing Apparel

Spots and shininess may be removed from dark skirts, coat frocks, and collars by brushing well and sponging with the following solution:—

1 teaspoonful of ammonia, $\frac{1}{2}$ pint warm water, $\frac{1}{2}$ pint strong tea or coffee. When nearly dry, press the material on the wrong side, or on the right side with a cloth between the iron and the material. Spots on light-coloured fabrics may be rubbed with benzine, using a clean cloth as soon as the one in use becomes soiled; it is often necessary to apply treatment all over the garment, as the application of benzine in parts causes a patchy result. For obstinate stains, rub with castile soap and methylated spirits.

How to Pack Clothing

(See p. 170.)



Fig. 119.—Wardrobe with Rod carrying Hangers

USEFUL GIFTS

It is often difficult, on the spur of the moment, to think of an appropriate gift for a man, woman, or child; so a list of suitable presents is given here which may be helpful in suggesting the right thing. Gifts of clothing, or of a very personal nature, should only be given by intimate friends; otherwise, gifts of a more general character should be selected.

For a Woman or Young Girl:

Bead necklace or ear-rings.
Bedroom door-knocker.
Belt buckles.
Book ends.
Dressing-table sets.
Electric travelling iron, or other electrical appliance.
Engagement pads.
Flowers—cut or in pot.
Flower vase or basket.
Folding or fancy coat-hangers.
Fountain pen.
Gloves—kid or fancy.
Gramophone records.
Hair ornament.
Handbag—silk, leather, or beaded.
Handkerchief or glove case.
Handkerchiefs of fine linen, lace, or cambric.
Incense burner.
Jewellery—brooch or other article.
Knitting or sewing bag.
Lace, real, or fine embroidery.
Library subscription.
Lingerie ribbons—assortment in various sizes.
Manicure set.
Material—dress or blouse length.
Note or card case.
Scarf—silk, lace, or wool.
Scent or toilet water.
Sewing basket.
Shawl—Shetland, woven, or silk.
Shoe buckles for dance slippers.
Shopping list, diaries, or writing case.
Silver—sweet dish, photo frame, or other article.
Sofa cushion.
Stockings—silk.
Tea cosy.
Teapot stand.
Toilet case.
Travelling sewing case.
Umbrella or parasol.
Valuable piece of china or glass.

For a Man or Boy:

Article of jewellery.
Bath robe.
Book ends.

Books for reference or recreation.
Camera or photographic materials.
Cigar or cigarette case.
Cigar or cigarette holder.
Cigarettes.
Collar box.
Cushion for desk chair.
Desk calendar.
Diary.
Electric shaving mug.
Fountain pen.
Framed photograph.
Handkerchiefs or gloves.
Hose—silk, lisle, or wool.
Newspaper holder.
Note case.
Office requisites.
Paper-knife.
Pencils—automatic.
Pipe, or favourite tobacco.
Pocket-book.
Pocket torch.
Reading lamp.
Safety razor.
Scarf—silk or wool.
Set of brushes.
Shaving mirror or toilet articles.
Smoking requisites.
Socks—silk or fancy.
Sports accessories.
Sports sweater.
Ties.
Tobacco pouch.
Toilet water or bath salts.
Tools in box.
Travelling clock.
Travelling comforts (folding coat-hangers or folding slippers).
Travelling flask.
Umbrella or walking stick.

For Small Children:

Articles of clothing.
Baby chair.
Book of pictures.
Clay modelling set.
Fancy handkerchiefs.
Fancy mug.
Feeding tray.
Gold safety pin.
Hot-water feeding plate.
Monogram spoon or table set.
Needlework box for girls.
Paint-box and paint-books.
Pair of shoes or gloves.
Silver napkin ring.
Toilet set—miniature.
Tool sets for boys.
Toys of all descriptions (rubber or woollen for babies).

HOLIDAY ARRANGEMENTS

Advance Plans

The weeks and days immediately preceding a holiday present numerous problems, and much extra work is thrown upon the mistress of a home; and if all the arrangements are to go smoothly and the holiday is to be an "unworried" one, plans should be made well in advance and a proper time set aside for each special duty. Otherwise plans are liable to go wrong and much extra work will accumulate at the last moment, with the result that important matters may be left undone, and many useful items will be forgotten.

Travel Holidays

When one or two persons have only themselves to please, the choice of a holiday is a simple matter. They have only to decide what form their holiday is to take, whether it be a short or prolonged stay at one place, or whether it should be an itinerant holiday on foot, on bicycle, by motor, or by train from place to place. When the kind of holiday has been decided upon and the place selected, the details of the itinerary, such as arranging for trains and hotels and the working out of a time schedule, should be left in the hands of one person only—or a tourist agency will undertake all such arrangements. The same applies when a number of persons are organizing a joint holiday. One of the members only should be selected to act as organizer and courier.

Family Holidays

Family holidays are the most difficult to plan. Here is a short list of the points which need considering:

1. Date of husband's holiday. Does this coincide with school holidays?
2. Length of holiday. Is Father staying away as long as the family, or, must special arrangements be made for him at home?
3. Choice of holiday resort. Will it be suitable for the children? Is it easy to

reach if Father intends "week-end" visits only?

4. Is the home to be locked up, let furnished, or is a maid to be left in charge?
5. The maids' holidays: how do they fit in with the family arrangements?
6. Holiday clothing, its choice and timely preparation, so that it may be in keeping with the type of holiday chosen.
7. Luggage: what is the minimum that can be taken, and are trunks and bags all in good repair, and with no keys missing?

Locking up the Home

No home should ever be left unguarded unless it is fully insured against burglary, fire, and all risks. (See Vol. II, p. 201.) And, even when it is, jewellery, silver, and small articles of very special value should not be left in the empty house if any sentimental value is attached to them and money cannot replace them. In the case of a short holiday, it is not necessary to make elaborate arrangements for leaving the house. All downstairs windows must be closed and bolted; while upstairs a few windows may be left open several inches at the top to prevent the home from getting a musty unused atmosphere. Special window locks can be used which make the windows secure. These are in the form of brass acorns which screw into the top sashes, allowing them to be pulled down three or four inches, but making it impossible for them to be pulled down any farther from the outside, nor can the lower sash be raised.

It is always a good plan to pull down the blinds in the sunny rooms, in order to keep hangings, curtains, and furniture from fading. All the smaller ornaments may be collected on trays and covered carefully with cloths or pieces of newspaper. All the cushions may be collected in a similar way, placed on a chair or sofa, and covered. A fortnight or three weeks is not long enough to necessitate the sprinkling of insect powders and moth

balls on carpets and furniture, and filling in the cracks round windows and doors. If the furniture is well brushed on returning from holiday there need be no fear of moths.

Leave Larder Empty

The larder must be left empty of all perishable foods, nor must any food be left in open tins or bottles. Groceries and dried goods will, of course, keep. The safest way of leaving a house is to bolt and bar the front door from inside, leaving by the back gate, which should be double-locked from outside. The key should be turned in the lock of every door and left there. This will delay a burglar when he breaks into the house through any one of the rooms. When once he is in there is no object in confronting him with locked doors whose locks he can easily and noiselessly pick.

Special Preparations

When leaving the home empty for a long period, all windows should be left tightly closed, and paper wedged inside all cracks and crevices and round doors and windows to prevent the entrance of dust. The registers of all chimneys may also be closed, or paper pushed into the chimneys, but it is most essential to remember to take this out on returning before a fire is lighted. Moth balls will keep pests out of the upholstery, and may be pushed inside the crevices of all upholstered furniture. Pieces of paper can be placed on the floors and carpets, and insect powder sprinkled on this. If the powder is sprinkled direct on to the carpet, it will be a very long time before the smell can be removed when the home is reopened. All curtains and hangings must be taken down, folded, and well sprinkled with moth balls and covered with newspapers or cotton sheets. Beds should be similarly treated, and a soiled cotton sheet from each bed—instead of being sent to the laundry—might be used for completely covering bed and bedding until the family return.

To Let a Home Furnished

It may be undesirable to leave the house

or flat empty, or the owner may wish to supplement the holiday budget by letting the home furnished while away. When the holiday is a short one—too short to make it worth while letting, dwellers in large towns or cities might sometimes be able to bestow a kindness on friends or relatives in the country, by placing their homes at the disposal of their country friends for the period of their absence. Dwellers in the country, on the other hand, may give pleasure to their friends in town by inviting them to use a country home for a few weeks. It is useless to try to let a house or flat furnished for less than four weeks, and even that period is considered a very short let, for the trouble and expense involved.

"Friendly arrangements" between landlord and tenant, in order to save the expense of a legal agreement, are not to be recommended. However short the period of letting may be, a properly signed and stamped agreement should be made; and for a short let it is usual for the whole of the rental to be paid in advance.

It is most important, also, to make sure that your insurance policy covers the risks when a house or flat is let.

Making an Inventory

An agent should be employed to compile a careful inventory of the contents of the house, which will be checked with and signed by the tenant when he takes over the house or flat and again before he leaves it. A home-made inventory does not answer the purpose. Professional inventories are very exact in every detail, cracks in china and scratches on furniture are noted, in order that there will be no disputes regarding any new cracks or scratches, and breakages and losses have to be made good by the tenant when he leaves. A professional inventory also states the condition of the house, of the wall-papers and paint, floors and curtains, and the condition of windows and locks, &c. Such an inventory may cost a few guineas to prepare, but it can be used as a basis for any future tenants with very little adjustment.

Everything must be left clean for the

incoming tenant, and should be left in exactly the same condition when he leaves. If blankets, curtains, and loose covers have not been specially washed when he comes in, he need not have them washed when leaving. Whether plate and linen is left is a matter of arrangement. And in regard to silver or ornaments it is generally more satisfactory to the tenant as well as to the householder if these are locked away in a cupboard together with family pictures and portraits, and other personal belongings. It is usual for one cupboard to be retained by the householder and locked up, but cupboard room must be provided in each bedroom and sufficient accommodation left in the other parts of the house.

House-Agent's Duties

Homes may be let furnished by placing them in the hands of a good agent, who will see to all the necessary details and charge the current scale of commission on the rental, if he effects a let. The agent is generally ready to draw up the agreement; take up bankers' and other references of the prospective tenant; make out the inventory; and, if desired, undertake to collect the rental at the specified times. A house can also be let furnished through an advertisement in a daily or local paper, and if, in this case, the owner wishes to keep the details of letting in his own hands he should be careful to take up reliable references, and insist on payment in advance of a proportion of the rental when the agreement is signed. It would be advisable to place the drawing up of the agreement itself in the hands of an agent who knows the pitfalls, or of a solicitor. The gas and electricity companies must be asked to read the meters on the day that the new tenant takes possession, and again when he leaves, so that he will pay for the full amount of gas and light which he uses, as well as for his share of telephone subscriptions and calls.

Arrangements for Master

When the master of the house is unable to stay away as long as the rest of the family, his comfort at home must be amply provided

for. Where there is only one maid and her holiday coincides with the family holiday, it might be possible to arrange for a daily help in the mornings, who will come early enough to prepare breakfast, and stay until the bed is made and the house generally tidied up. The master can then arrange to dine at his club, with friends or relatives, or at a restaurant before returning home at night. If more than one maid is kept, it is generally possible to arrange for one of them to be at home to look after the master. Everything should be left comfortable for him, and at least one sitting-room should not be "packed up" and covered with dust sheets; also, the wherewithal to entertain any friends he may bring home, to help him pass an evening, should be left ready to his hand.

What to Take

In the matter of clothes the housewife should decide well in advance what will be needed for herself and her husband and children, so that everything can be prepared and ready when the time comes for packing. Let her remember, however, that too many clothes encumber a holiday. They mean an unnecessary number of trunks, involving both extra trouble and expense. A wardrobe for a fashionable resort will, of course, be quite different from the clothing which is needed at a farm or in a small fishing village. Nevertheless it is well to remember that a fashionable seaside resort is well supplied with competent laundries, and undergarments as well as frilly top frocks, when soiled, can soon be washed and ironed. Unless a maid is taken, a large number of frocks and hats is only cumbersome, and also hotels seldom provide suitable accommodation for large quantities of expensive clothing.

The time of year will be the first consideration in choosing clothing to take away; but, even in summer, cold weather must be provided for by taking a long coat and a woollen sports coat, and for wet weather a mackintosh or waterproof coat. These, together with the usual coat and skirt, are all the provision necessary for dull days. With

regard to hats, a toque or small hat is generally worn on the journey, which will be useful for morning wear. Some form of woollen cap or tam o' shanter is particularly useful in wet or rainy weather, and a larger hat for sunny afternoons completes the "necessities" in headgear.

Children's Holiday Clothes

For children, washing frocks are most useful, but cold weather must be provided for in a similar way as described for their mother. One or two warm suits or dresses might be included, as they cannot very well wear knitted coats over thin frocks indoors. It is generally a temptation to take too much underclothing, whereas this can be washed, while away, every week. Three of each garment—one off, one on, and one in the wash—forms a useful basis, with the extras which are required for special frocks. Extra warm underclothing should be provided for emergencies, especially for the children.

Boots and shoes should be serviceable first, and ornamental second, if any walking is to be done. Plimsolls and canvas shoes will be handy for the beach, as sea-water spoils leather. Two pairs of good walking shoes or boots and a pair of comfortable shoes for indoors, together with another smarter pair for special occasions, provide a useful list of foot-wear.

Packing List

A good plan is to make out a packing list of all the articles that will be wanted, about a fortnight ahead of time. This list is sure to need revising, and if anything really important has been forgotten it will probably be remembered before the time comes to pack. Husbands and grown-up sons should be consulted about their own lists, so that these may contain the suits and clothing which they really want, and the packing can later be proceeded with without having to consult the men about every separate item.

It is useless to fill up a trunk with articles that may not be wanted or which, if needed only in a remote emergency, are procurable on the spot. A list should be prepared for each member of the party, and when the

time comes to pack it will be a simple matter to lay out the articles listed and pack them carefully and methodically. Here is a short list of articles which are often forgotten, and should be included in every family trunk.

A few sheets of good notepaper and envelopes and fountain-pen.

A small needlework box, with needles, cottons, mending-wool, and safety-pins.

At least one pair of shoe lasts for wet shoes.

Folding coat-hangers.

Two packs of cards for wet evenings.

Two or three indoor games for the children.

Toilet soap (for Continental resorts).

Tooth powders or pastes.

A simple laxative.

Antiseptic ointment, such as boracic, for scratches and cuts.

India-rubber hot-water bottle.

A clothes brush.

How to Pack

A well-packed trunk will hold a great deal more than a badly-packed trunk. Further, clothing will emerge from a tightly-packed trunk in much better shape than from one which is only half filled, provided it is properly and carefully folded. When a loosely-packed trunk or box is placed on end, the clothing slips down to one side in a heap, and when the trunk is opened it will be found in a crumpled and jumbled condition. To pack well, every square inch of trunk space should be utilized. For instance, to pack an ordinary square trunk the procedure should be as follows:

Small boxes in which gloves, handkerchiefs, &c., are packed should be placed at the bottom of the trunk and fitted as close to each other as possible. Stockings and little oddments can be jammed into the spaces between the boxes to keep them tight, boots and shoes should each be wrapped up singly in paper, and also fitted tightly into the bottom of the trunk, unless a separate shoe bag is taken. Such a bag is often very useful for a large family. On the top of the boxes and hard things, underclothing may be laid, and this should not be packed in bundles of uneven sizes, but laid in piece by piece so that it forms a flat layer, covering the whole area of the trunk. If this does not fill up the

trunk tightly as far as the tray, some of the thicker and heavier clothing can be laid down, such as skirts and underskirts, which can be folded flat. Trousers and waistcoats will also pack well into this space.

Packing the Tray

The tray should be reserved for dresses, blouses, and coats, and these again should be packed as flat as practicable. The clothing should be laid along the whole length of the tray and stretched across the width, so that as few folds as possible are needed. Part of the heavy and flat clothing might go in

skirt where it is to be folded over to fit the length of the trunk. This precaution will avoid sharp creases. In order to pack flatly, lay skirts in opposite directions, as top to bottom, and bottom to top.

Folding Dresses

Cloth and heavy material dresses should be packed on the same principle as skirts. Place the skirt into the trunk first with the bodice hanging over the end of the trunk; pack skirt as described above. If the bodice is of the severely plain variety, which folds up like a handkerchief, lay the sleeves flat

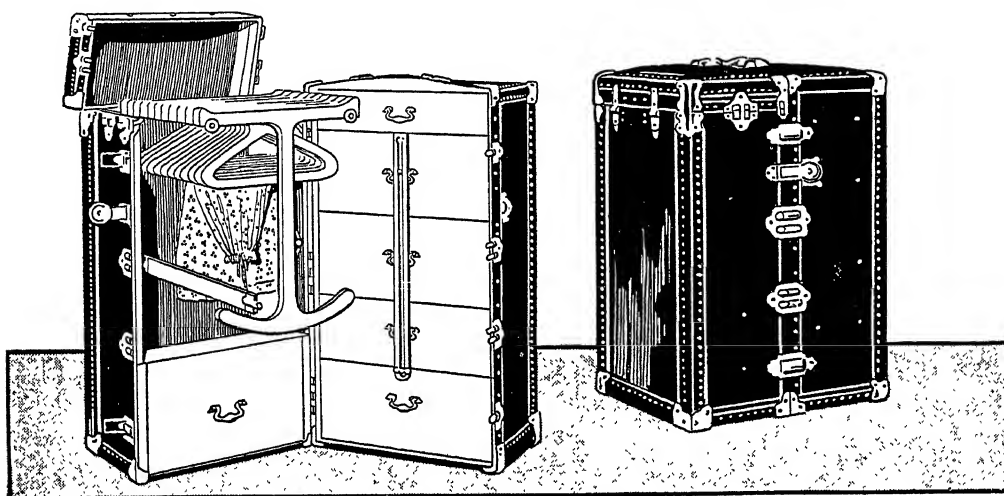


Fig. 120.—Wardrobe Trunk—open and closed

first, including skirts and woollen coats; next will come the flimsy and lighter dresses, under which a clean linen towel should be placed and another to cover them over. (A few extra towels are generally found very useful on any holiday.) Then should come silk bodices and coats packed in the way to be described below.

To Pack Skirts

Lay flat along the whole length of the trunk, so that there are no creases either on the upper or lower side of the skirt. Long loose twists of tissue paper will then be placed up each side of the skirt where it will require folding over to fit the width of the trunk; a similar twist may be placed at the top of the

and fold them over across the front of the bodice, then fold over the bodice after placing a twist of paper in the crease. If the bodice is an elaborate one with full sleeves, see *Blouses*, on p. 172. Thin cotton and summer frocks, which are severely plain, may be folded quite flat like a handkerchief; but this should be done with only one fold at the waist and as few other folds as possible. Creases can be entirely removed from silk dresses when they are unpacked, by placing them on hangers in the bathroom and turning on very hot water; the steam which fills the bathroom will entirely draw out the creases. The dress should be allowed to hang for a few hours until the dampness has been drawn out.

Blouses and Bodices

Lay these on a bed so that the back is quite flat, then arrange the front so that it also lies as flat as possible. It may be necessary to place some crumpled tissue paper inside the bust. If the bodice is made with a frilly or gathered front, small bunches of crumpled paper may be placed inside or under these to prevent creasing. Full or puffy sleeves should be loosely filled with tissue paper and folded across the front of the bodice, which can now be carefully lifted into the trunk. Blouses which are quite simple and flat can be packed on a flat surface with as few folds as possible.

If it is not possible to fill the bottom of the trunk with underclothing, shoes, and sundry boxes, it is sometimes a good plan to pack a number of bodices, blouses, and silk undershirts into a cardboard box, and place this, in the bottom of the trunk where it cannot slip about. This arrangement often enables the tray to be left entirely free for packing hats.

Coats

(See *Men's Coats*, p. 173.)

To Pack Hats

These need every possible care, and the most important point to remember is to pack them in such a way that they cannot slip about and that they cannot be crushed. Small hat trunks are generally used, and these are fitted so that a hat can be firmly fixed to the bottom, top, and each inner side of the box, while caps and small felt hats may be placed in the centre. Many people, however, do not possess a hat box, or they object to the extra piece of luggage it involves. In fact cardboard hat boxes—such as are used by shops to deliver their millinery—are most generally used. If they are utilized for travelling purposes, plenty of tissue paper must be used inside the crowns, inside the bows, and round the hats so that they cannot be crushed, and to prevent them

from slipping about. Plain hats of different sizes can even be placed one inside another with advantage. The box must be firmly tied up with good stout string, and can be further fortified by making a "cage" of thick wooden bands nailed crossways over the top, bottom, and sides. This is particularly useful when cardboard hat boxes are to be sent by post or carrier.

An extra piece of luggage can very often be saved by packing the cardboard hat box into the bottom of the trunk, or by leaving one of the trays empty for hats. When the latter course is possible, the hats should be sewn through the brim on to the canvas bottom of the tray, to prevent them from slipping when the trunk is moved. If the crowns are well stuffed with tissue paper (or stockings, woollen underclothing, or any

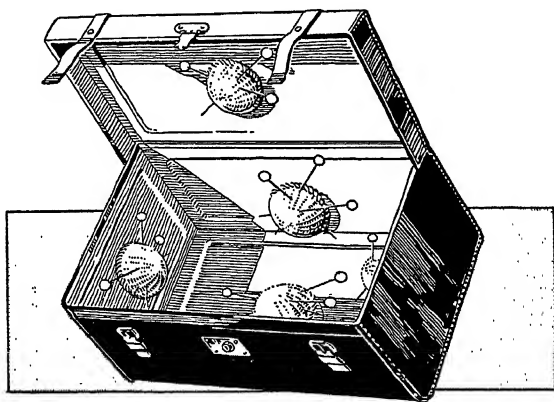


Fig. 121.—Ladies' Hat Case

other soft articles of clothing) the space between the hats may be used for packing soft undershirts and blouses, and light dresses may be laid across the top.

Gloves, Handkerchiefs, and Sundries

It is best to pack all sundry articles of a small nature into separate boxes—which should, however, be tightly filled. These boxes will be useful at the other end of the journey and save much unnecessary unpacking and "putting away".

Men's Clothing

The trousers should be folded flat, as for placing in a trouser press, with the crease in the proper place—down the centre back and centre front of the leg. Lay the trousers on a flat surface in the trunk and fold back the top as near to the waist as the length of the trunk will allow. Lay the next pair of trousers on top of and to the side of the first pair in the opposite direction.

Men's Coats

Lay the coat flat on a bed or table with the lining downwards. Insert some crushed tissue paper in the tops of the sleeves and lay the sleeves as flat as possible down the fronts of the coat. Now fold back each front, with the sleeve, across the back. If the trunk is long enough, lay the coat into it without any further folds. Otherwise, a fold should be made over a roll of tissue paper more than half-way down the coat.

Men's Sundries

Collars should be packed in collar boxes, and the centre space may be filled up with handkerchiefs. Shirts must be packed flat and separately, not in bundles. Ties should also be laid flat with only one fold in the centre of the back.

Toilet Necessaries

Brushes and combs and all sorts of toilet accessories are generally packed last because they are in use up to the day of departure. If the trunks are quite full or fastened down, or have been sent in advance, a small handbag should be used which is large enough to contain all the family toilet necessities. Brushes and combs should have been quite recently washed, so that they are clean to take away. Damp sponges and face-cloths must be put into small mackintosh bags, which are specially made for the purpose, and one of these should be provided for each member of the family.

Persons who travel often should have a separate set of toilet accessories, which are specially kept for travelling and are always ready. In this way the handbag will contain

clean brushes and combs, dry sponges and washing flannels, a tablet of soap, a clean tooth-brush and tooth-paste, and will be ready whenever it is wanted without having to worry about last-minute details.

Last-Minute Packages

These are, as far as possible, to be avoided, because they are generally unsightly as well as cumbersome. The handbag for toilet necessities should be large enough to contain a few small items which may have been forgotten, and possibly such refreshment as may be needed for the journey.

If, however, the party is a large one, the refreshments may be packed separately in an attractive market bag, or a large tin box neatly covered with brown paper which can be abandoned when empty. Umbrellas and sunshades should be neatly rolled and packed together with sticks in one package. A golf bag makes a neat receptacle in place of the ordinary umbrella case.

Fastening and Labelling of Luggage

All labels should be ready addressed on the day before they are needed, and one tie-on and one stick-on label provided for each piece of luggage. They must be fully and clearly addressed in case any of the luggage is mislaid. Very neat and strong leather address tabs can be obtained, in which a large addressed visiting card may be inserted.

Large trunks may be left open until shortly before departure to avoid unnecessarily crushing the contents. The key to each trunk should, however, be ready inside the lock, or tied on to the trunk in readiness for use. When the trunks are fastened, all the keys should be assembled on a ring and put in a basket or handbag, where they cannot be lost or forgotten. Luggage which has seen its best days, or with faulty locks, will need to be tied with strong rope, and this should be in readiness, and not have to be obtained at the last moment. Hat boxes may be fastened and tied up on the day before they are needed.

Dispatching Luggage

Much trouble and expense can often be

saved by sending the large pieces "in advance". The railway tickets will have to be purchased a few days before they are needed, and the railway company notified of the date when the luggage is to be called for. The company will call for the trunks at a small fixed charge per piece, and deliver to the house to which it is addressed. During a busy travelling season it is well to send the luggage at least two or three days ahead, so that it may reach its destination at the same time as its owner. "Luggage in advance" is a convenience which often saves the expense of a special omnibus or taxi to convey it to or from the station, and all the trouble of registration and incidental expenses at either end of the journey.

When it is inconvenient to send luggage in advance, it is often possible to arrange for a local tradesman to convey it to the cloakroom of the railway station, and to bring the

cloakroom tickets on the evening before the journey is made, which may save considerable expense. One of the members of the party can then go to the station on the day of the journey—in advance of the others—get the luggage out of the cloakroom and register it through to its destination. Arrangements for the dispatch of the luggage should be thought of in good time, so that the best means of conveyance can be arranged for.

Registration of Luggage

All large pieces sent by rail must be registered as well as any smaller pieces which are not taken into the compartment. Registration receipts must be carefully kept in order to claim the luggage at the end of the journey. A fixed extra charge is made by the railway companies for children's perambulators, cots, and baths.

PICNICS—AND HOW TO ARRANGE THEM

There is always a fascination about a picnic—to the adult as well as to the child. A long tramp, sunshine, and a well-chosen picnic spot combine to whet the appetite and lend a charm to what would otherwise be a very simple and ordinary meal.

A well-arranged picnic, however, need by no means be ordinary. The picnic menu should be as carefully thought out as a luncheon or dinner menu. And it should also be considered from the point of view of those who will be expected to carry the packages during a long cross-country tramp—unless, of course, a motor-car and fitted basket make this consideration unnecessary.

Family Picnics

The happiest picnics are those which are planned for the children, and these should be primarily suitable for young digestions. Two picnic menus are given below, which might serve as examples of dainty satisfying meals which are easy to prepare and pack.

PICNIC MENU No. 1

Small Sardine and Cod Roe Sandwiches
Cold Lamb Cutlets, breaded; hard-boiled
eggs; fresh long Lettuce and Tomatoes
Baked Apple Dumplings
Fresh Fruit in Season
Iced Coffee or Lemonade

PICNIC MENU No. 2

Tinned Salmon and Lettuce
Roast Beef, Ham and Tongue Sandwiches
Veal and Ham Pies
Tomatoes and Water Cress
Jam Sponge-sandwich
Fresh Fruit in Season
Hot Café au Lait

In Menu No. 1 the fish sandwiches should serve the purpose of a dainty appetizer, and should therefore be cut thin—two or three small sandwiches being allowed for each person. The second course of lamb cutlets is the principal one, therefore a large cutlet should be provided for each person, with a few extra; and a hard-boiled egg for each.

It is suggested that the cutlet should be fried in egg and bread crumbs, because preparing it in this way keeps in all the natural juices and the flavour of the cutlet, besides making it more attractive in appearance when served cold. Cutlet frills should be put round each cutlet bone for holding it.

A Colour Note

A pretty note of colour can be given to the picnic menu if the hard-boiled eggs are dyed two or three different colours. A little cochineal, added to the water in which they are boiled, colours them a beautiful red; coffee will make them brown; and green, blue, and yellow vegetable colourings can be obtained from any grocer, if a greater variety of colours is desired.

Long lettuces, which can be cut in six or eight pieces lengthwise, are best; and the salt must never be forgotten. The apple dumplings are made by folding pie crust over a peeled apple and baking in an oven until done. Fruit should never be omitted from any picnic menu, and iced drinks should be prepared well in advance and set on ice. Carried in vacuum flasks, they will retain their icy coldness.

Menu No. 2 requires little explanation. It will be noticed that neither menu consists of a great many sandwiches. Bread is very filling and should not be eaten in too great quantities. An ideal open-air meal should be light and satisfying.

Packing Utensils

As few utensils as possible should be taken for a picnic with much walking. There is a certain amount of pleasure in carrying a picnic parcel while the picnic is still to be eaten; but there is very little pleasure in carrying home a bulky parcel of knives and forks and plates and other picnic paraphernalia, when the picnic itself is already a thing of the past! For Menu No. 1 no knives and forks or plates whatever are required. Pretty cardboard plates may,

however, be obtained in several sizes at a very reasonable price. These are useful to set out the various courses, and, if lace-paper doyleys are used, very few of the cardboard plates will be needed. The lace doilies can be changed for each course, while the plate can be used again. The cardboard plates can be discarded after the picnic.

A small table-cloth or a very large napkin should always be taken, and the pretty paper cloths obtainable, with paper napkins to match, take up very little room in the picnic parcel and need not be carried home. Nor need china cups be taken when *papier mâché* containers can be used. These containers can be purchased at most stationers and may be discarded after use. This leaves only the vacuum flasks to carry home.

For Picnic Menu No. 2, a few forks will be required for the first course of salmon and lettuce. If desired, this course can be prepared at home by arranging a portion for each member of the party in a *papier mâché* cup, lining this with lettuce leaves and placing the salmon in the centre.

How to Pack

A picnic meal should be as fresh when it is unpacked as when it goes into the parcel; and some thought should therefore be given

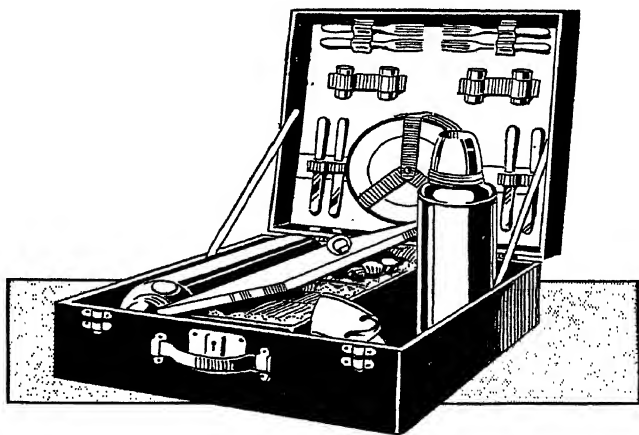


Fig. 122.—Picnic Case

to the manner of packing. Sandwiches, cakes, and pastries must all be packed in grease-proof paper—being careful to keep each variety of sandwich separate. Lettuce, cress, and other green stuff which is likely to lose its freshness, should also be wrapped in grease-proof paper. All food keeps freshest if packed in tins, and it is a good plan to get from your grocer a biscuit tin ($3\frac{1}{2}$ -lb. size), in which to place all the packages of sandwiches and other eatables. The tin should be packed tightly to keep everything in good condition, and it may even be possible to include some of the paper and the *papier mâché* utensils in this parcel. All the rest of the utensils and vacuum flasks can be made into a separate handy package. Cover the large tin with neat brown paper, and tie so that a leather holder can be inserted between two rows of string at the side. This makes the package far more easy to carry than if it were carried only by the string.

A River Picnic

A river picnic—for adults only—is generally a more elaborate affair because it does not involve any carrying. If a picnic basket is not used, the size of the hamper is immaterial. For a river luncheon a small table-cloth and luncheon napkins are generally provided, as well as plates and table cutlery in sufficient quantity. The menu is more elaborate, and sandwiches do not necessarily figure in it. Two menus for river picnics are suggested, one of fresh food and the other mostly tinned.

RIVER PICNIC NO. 1

Hors-d'œuvre

(Cod Roe, Smoked Salmon, Tomato Salad,

Sardines, Potato Salad, and Olives)

Cold Chicken, Veal-and-Ham Pies

Lettuce and Tomato Salad

and Mayonnaise

Fruit Tart

Coffee Mould and Cream

Fresh Fruit

Hot Tea or Coffee

RIVER PICNIC NO. 2

Tinned or Fresh Salmon

Fresh Lettuce and Mayonnaise

Meat Patties and Paysandu Tongue

Potato Salad and Russian Salad

Fruit Salad (tinned or bottled)

with Preserved Cream

and

Sponge Fingers

Orangeade or Cider and Claret Cup

Preparing the Menu

In the first menu, each of the *hors-d'œuvre* should be prepared and packed in *papier mâché* containers with disc tops, on which the contents are written. The chicken should be packed whole, in grease-proof paper, and also the veal-and-ham pies. The fruit tart should be put back into the tin in which it was baked, to prevent it from breaking; and the coffee mould should not be turned out until it is needed.

In Menu No. 2 a glass dish should be provided for the first course. The lettuce leaves should be arranged round it and the salmon turned out of the tin into the centre. A bottle of mayonnaise will probably be needed. Crisp dinner rolls and butter pats should also be provided with this menu. The fruit salad should be turned out into a glass bowl, and glasses must be provided for the drinks.

Most boating parties are equipped with all the necessities for boiling water for tea or coffee, so that a picnic presents no difficulties. With regard to other beverages, unless anything special is required, these can generally be obtained at the inns or hotels alongside the banks.

Motoring Picnics

The menus for this—carriage being easy—will be elaborate and similar to a menu suggested for the river picnic. Most motor-cars carry luncheon baskets fitted with all the necessities of a conventional meal. Narrow folding tables which can be set up in the body of the car are very useful on a long tour, on which many meals are to be taken out of doors, and such a table is quite easily stowed away in the car.

Novel Suggestions

There is much more charm in novelty than in a studied elaborateness, and by preparing some small surprises a touch of originality can be added to what may otherwise be quite an ordinary picnic. This may be in the form of a humorous menu card, burlesquing the name of each course, or possibly naming each course after one of the guests whose favourite dish it may be. Or surprise packages might be prepared. The picnic might end up with a lucky dip for the last course, the contents of each package being unknown, and each package

containing something different. Put a few kindly "teasers" in some of the packages—such as a piece of coal in one, and a piece of imitation fruit in another—and much enjoyment is provided.

Another capital picnic idea for children is to suspend the fruit or buns on pieces of string from the branch of a tree, to be eaten in their hanging position by the children, with both hands clasped tightly behind their backs.

If no particular member of the party is to be the "beast of burden", each of the party might be given his own small package to carry.

THE MOTOR-CAR: ITS SELECTION AND MAINTENANCE

So much has the motor-car become a part of the national existence that no upper- or middle-class home is now complete without one. The first question which naturally presents itself to the would-be motorist is: Can I afford to buy and run a car? This problem can only be solved when the precise financial position of the prospective owner is known. It must always be remembered that first cost, though important, is by no means paramount, and that inevitably ownership of a motor vehicle that is in regular use entails steady outgoings, which amount to an appreciable total in the course of a year.

Type of Car

The main consideration likely to determine the type of car to be purchased is the depth of the prospective owner's purse. Having reached a decision as to the amount of money that can be spared to buy the vehicle, one has to determine whether the car shall be a two-seater or a four-seater, and whether it shall be of the open touring or of the enclosed variety. Where first cost is a material factor, it is probably best to invest in an open car, equipped with the modern up-to-date hood and side curtains.

There have been most important develop-

ments of late in connection with what is known as all-weather equipment for touring cars, and, unless one can afford closed body-work constructed by a first-class firm, it is, I think, preferable to adopt the compromise represented by an open touring body with hood and side curtains capable of adequately protecting all the occupants of the car in bad weather. Formerly, hoods and curtains left much to be desired, but to-day they have been brought to a degree of excellence that renders the car to which they are fitted in most respects practically the equal of the true landaulet, cabriolet, or coupé.

Convenience of Four-Passenger Car

The beginner is often tempted to purchase a two-seater. My advice is to refrain from doing so, and to invest in a car designed to carry four passengers with comfort and five in an emergency. Not only is the dickey of a two-seater far from an ideal resting place during a long journey, but experienced motorists will admit that it is more convenient, as a rule, to carry luggage under the protection of the hood in the rear compartment of a four-seater body than on an exposed platform at the back of the average two-seater. The running expenses of a four-seater are not very much greater than

those of the less commodious car, and it is safe to say that the advantages of the former far outweigh any drawbacks it may possess.

The Make of Car

The type and seating capacity having been decided upon, one is faced with the most important problem of all. This is the selection of the best car for one's purpose from the multitude of different makes available. If the prospective purchaser is a novice, I cannot too strongly recommend him or her to seek the advice of a well-qualified and unbiased professional consultant. Such a man, if he has a fairly large practice, should be well acquainted with the pros and cons of many makes, and, if his client gives full particulars as to precisely what is needed, it should not be a difficult matter for the consultant to recommend a suitable vehicle.

Unless the purchaser can fully rely upon his own judgment, he should invariably insist upon the final selection being made from the ranks of cars with established reputations. By so doing, not only will he avoid the risk of buying a pig in a poke, but also he will ensure a reasonable market for his car should he desire to sell it second-hand in due course.

Main Items of Expenditure

The main items of unavoidable expenditure include fuel, lubricating oil, tyres, repairs and replacements, taxes, insurance, depreciation, and garage charges. There are also the wages of a chauffeur, if a paid attendant is retained to look after the vehicle. No prospective owner should take the final plunge until he has made all possible inquiries concerning the items enumerated, since it would be difficult to imagine anything more annoying than to discover, after the car has been purchased, that for financial reasons it cannot be used for all ordinary purposes.

Petrol Consumption

To take first the matter of petrol, obviously the fluctuation of prices in the oil market

cannot be foreseen, so that this item must inevitably be problematical. It is, however, advisable to ascertain the present price of motor spirit, and to calculate the annual expenditure with two or three different types of car with a known fuel consumption. Each manufacturer is prepared to inform a prospective purchaser as to the mileage per gallon his car will run, and if one assumes that the annual mileage will be, say, 6000, which is a normal figure, a close approximation to the actual expense for motor spirit can be made.

Lubricating oil is not a serious item, since it may reasonably be anticipated that a car will consume not more than 1 gall. for every 1000 miles covered.

Expenditure on Tyres

So far as tyres are concerned, it must be borne in mind that the larger the car the larger, and, therefore, the more expensive, will be the tyres. Here, again, one cannot foresee the fluctuations in the rubber market, and the best plan is to take the present price of tyres from a manufacturer's catalogue, and then calculate that, with reasonable good luck, the vehicle should travel 6000 to 7000 miles before renewals are called for.

Repairs and Renewals

Repairs and renewals need not be considered very seriously by the purchaser during the first year of his ownership. The modern car is built of thoroughly good material, and, if it is reasonably maintained, no important replacements should be required for, at any rate, 10,000 miles. After that distance it may be desirable to take up slackness in crankshaft and big-end engine bearings, and the steering joints may call for new pins and bushes. The cost of these can, as a rule, be ascertained from the makers' spare-parts list.

Those with no mechanical experience might be well advised, before purchasing a car, to undergo a short course of training at one of the approved motor schools. The cost of these courses varies according to the establishment patronized, but a detailed prospectus can always be obtained from the

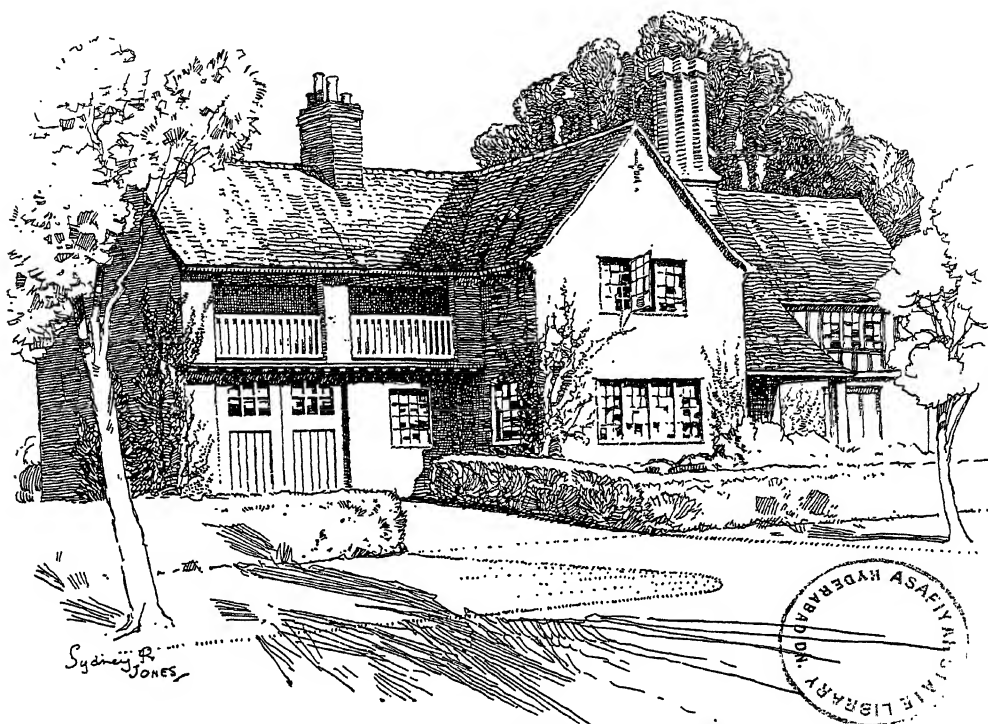


Fig. 123.—Garage attached to a House with open-air Nursery over

school. In this connection it is well to add that the Royal Automobile Club issues an official appointment to approved schools, and, therefore, the Club should always be consulted as to the *bona fides* of any training establishment.

Garage Expenses

Garage expenses differ widely according to the district in which the accommodation is required. If the car owner possesses a motor house, stable, or large shed on his own ground, no additional expenditure will be called for. If, however, it is necessary to house the car elsewhere, preliminary investigations as to the cost and quality of accommodation available should be made. In country districts it may be that reasonable storage facilities can be obtained for 7s. 6d. per week, but in big towns the figure may well be anything from 15s. to 25s. per week.

Taxes, Insurance, &c.

The annual tax is a burden that can be ascertained definitely in advance. The tax on private cars is calculated according to the horse-power ascertained by what is known as the Treasury or R.A.C. rating.

Insurance rates are prone to fluctuation, but they can always be obtained from any of the reputable insurance companies. All that one can say is that unlimited cover should be secured against third party claims, and the vehicle itself should be insured for a reasonable agreed figure each year. The matter of depreciation, though frequently overlooked, should be taken into account. It is impossible to put a definite limit to the life of a car, for so much depends upon the manner in which the vehicle is treated. It is, however, well to be on the safe side, and to calculate depreciation annually at a

figure that will within five or six years wipe out the first cost. A conservative estimate of depreciation is 20 per cent per annum.

Finally, there is the possibility of employing a chauffeur. The great majority of present-day car owners look after their vehicles themselves, but a good man can be obtained for anything between £3, 10s. and £5 per week.

Care of Car

It is quite impossible here to advise in detail concerning the best means of maintaining a car in good running order. We may, however, say that the majority of modern motor-cars are singularly long-suffering, and do their work without complaint if they are given but a very reasonable amount of attention by their owners. Obviously, the first duty of the car owner is to see that the mechanical units are provided with the requisite oil and grease. It is far better to give too much lubricant than too little, and slackness in following out the makers' recommendations for lubrication may very soon lead to trouble of a serious and expensive nature.

A hint which may prove useful has to do with unusual noises in the mechanism of the chassis. The owner very soon becomes accustomed to what we may call the standard noises made by his car when running on the road. His ear automatically attunes itself to this sound, and should, equally automatically, register to his brain any extraneous noise that may develop. Such noises should be investigated promptly, for the chances are that they may indicate slight derangements which, if tackled at once, can be put right so that no serious harm will be done. If, however, these unusual noises are disregarded, the trouble will probably become more pronounced very quickly, and a crisis may arise involving a bad breakdown, with a resulting repair bill of alarming proportions.

Overhaul Weekly

A good general principle is to go carefully round the chassis at least once a week, and make a search for slack connections, loose nuts, and the like. If such a periodical in-

spection be undertaken, the owner will soon obtain a very close and intimate knowledge of his car, and will be in a position speedily to diagnose any little trouble that may occur. For the ownership of a motor-car to be a real pleasure, it is essential that the man should be in sympathy with the machinery under his control, and such sympathy can best be achieved by regular and frequent examination of those portions that are subjected to the chief stresses imposed by normal running service.

It would be a mistake to imagine that the maintenance of a modern car calls for the expenditure of much time or the possession of mechanical knowledge of a high order. As a matter of fact, if an hour be spent every week on a careful examination of the chassis, it should be sufficient to ensure good and reliable service. As regards technical knowledge, if the car owner can handle a screw-driver and spanner, can clean or change a carburetter jet, and is able to adjust the points of his magneto's contact breaker, it is very unlikely that he will fail through lack of knowledge to reach his journey's end safely and to time.

In conclusion, we may say that the rapid growth of automobilism has inevitably led to the springing up of garages throughout the land, so that, however inexperienced a car owner may be and however helpless he may feel should a breakdown occur on the road, he is never likely to be far out of reach of expert assistance.

Building the Garage

A garage may range from the very simplest kind of shed that merely affords protection to a car from the elements, to an elaborately equipped building fitted with electric light, water, and central heating, with a mechanics' bench, a repair pit, and a covered-in washing yard. The average car-owner will desire to strike a medium between these extremes. The main requirements are that the building shall protect the car; that there be adequate floor space for it; room for a work-bench, and for the storage of spare parts, &c.; space for repairs and for washing down.

Considered individually, the first re-

quirement is for a properly constructed building, which should, if possible, be of fire-resisting materials. Concrete is one of the most suitable materials for garage construction, since it enables a strong yet comparatively light building that is both dry and fire-resisting to be erected quickly and cheaply. The walls can be either of concrete blocks or of solid concrete built between shuttering. Brick- or stone-work may, of course, also be used, or weather boarding, although the last is less satisfactory. There should be a solid concrete floor laid to a fall, so that water used to wash down the building or the cars will drain away. The floor space will, of course, vary according to the number and size of the cars, but the width of the garage should allow at the very least 1 ft. 6 in. passage on either side of the car, and 1 ft. between cars abreast. The doors should be 2 ft. wider than the over-all dimension of the car.

Calculating Size of Garage

The work-bench should be placed at the back of the garage, and it should be well lit, if possible by a small side window and a larger window some height up in the end wall. The window in the end wall should not be immediately above the bench, as this space will be wanted for tool racks. In calculating the length of the garage, 2 ft. 3 in. should be allowed for the bench and 2 ft. for a man working at it. There should be 1 ft. clearance in front of the car, so that the garage should be 5 ft. 3 in. longer than the over-all length of the car. The bench will not run the whole width of the garage, and there will therefore be room adjacent to it for storing spares, tyres, &c.

A pit is a very great advantage for carrying out repairs. The size again will depend on the car. 4 ft. 6 in. is a convenient depth. A recess for tools in the side of the pit will

be found useful. A cover can be made of 2-in. boards with counter-sunk lifting handles. In front of the garage there should be a concrete washing yard, properly drained. It is a great advantage if this space is roofed, enabling repairs to be done in the open under cover. This space will also afford a covered place for the car to stand in during the day without always running it into the garage itself.

Heating and Lighting

The garage should, if possible, have central heating. This can either be arranged in connection with the house, if it is not too distant, or from a separate coke-fired boiler placed in a little boiler-room adjacent to the garage. The best place for one or two radiators is against the long walls. But if placed here they must be built into recesses, so as not to stand out into the garage. Another good place is against the end wall adjacent to the bench, but this position will not distribute the heat so satisfactorily. If current is available the garage should be electrically lit, and there should be at least one plug point for attaching a movable lamp for working in the pit. There should be a stand pipe just outside the garage.

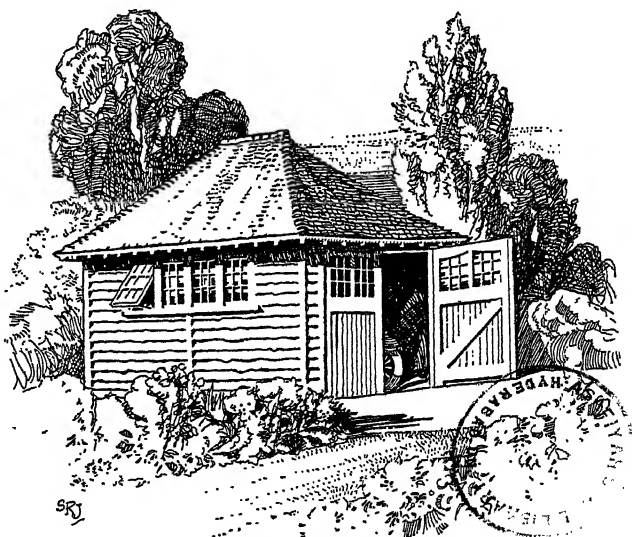


Fig. 124.—A Wooden Garage.

Building an Extra Room

When building the garage, it may at the same time be desirable to enlarge the main building by adding an extra room over the garage or a couple of rooms, to be occupied by the gardener or chauffeur. This should be thought of when the garage is designed, for the expense of the extra floor is comparatively small. If the garage is incorporated with the house, the extra room can be easily reached by a door from the main building and used as a dancing or billiard room. If, however, the garage is a separate building, other means of access must be arranged for from below.

Architectural Harmony

There is a tendency for garages to be

unsightly. This is lamentable and quite unnecessary. The garage should be designed so that it harmonizes with the house. This does not entail extra expense, for a simple, well-designed structure will be no more costly than an ugly one. There is no reason why the garage should not be incorporated with the house, provided it is properly separated by a fire resisting wall and ceiling. There can be a small door giving direct communication between the garage and the house, and this should be planned if possible in connection with a lavatory lobby, so that in coming from the car one washes and then passes into the main part of the house. The garage may thus be turned from an unsightly outhouse into an architectural asset, and at the same time be convenient of access.

WIRELESS IN THE HOME

Wireless has brought people nearer to a realization of the unseen world than anything ever has before, because it has taught us that every moment of the day impulses are passing through our bodies which only require the aid of a simple instrument to become vocal and to reproduce, with perfect accuracy, words spoken many miles away.

What is Wireless?

In America it is called radio, and the American word gives rather a better idea, perhaps, of the thing with which we are dealing, because the ether waves employed radiate in all directions from the transmitting centre. The analogy that is almost invariably quoted in textbooks is that of waves caused by the dropping of a stone into a pond. From the place where the stone strikes the water waves radiate in circles, and so travel over the whole surface. Similarly, if a stick, resting on the water, is struck, waves will radiate; and if another stick is floating upon some other part of the pond, it will faithfully reproduce the movement of the first stick as the waves pass beneath it. This is a close analogy to wireless broadcasting.

Wireless Waves

Wireless waves are set up in a medium called the ether, which permeates all space and all materials as water permeates a sponge. There has been some discussion amongst scientists as to whether such a thing as the ether really exists, but as one distinguished body of men holds that it does, and as this hypothesis materially assists a simple explanation of the action of wireless, we will assume that it does. That being so, we may say that no metal or stone is so closely made that the ether cannot permeate it; and that is why ether waves will travel through almost any obstacle and will actuate a wireless receiver in almost any locality. The waves set up in the ether are known as electro-magnetic waves, because they have both electric and magnetic properties. It is important always to remember this, because, by overlooking it, many mistakes may be made in installing a wireless set.

Wireless waves are generated at a transmitting station by the creation of a state of electro-magnetic strain in the ether. This may be likened to the straining of the elastic



WOOD CARVING

A panel of "Waratahs" by Ruth Bannister, carved out of a solid block of Australian Beech (White Mahogany) $10\frac{1}{2}$ " thick. The Waratah is an Australian native wild flower.

in a catapult. If the catapult is directed at a pond, when the elastic is released the stone in it will strike the surface of the water, and waves will be created. In just such a way electro-magnetic strain and release at a wireless transmitting station create a continuous flow of wireless waves which radiate in all directions, carrying with them their quota of electro-magnetic energy. They will pass through practically anything that comes in their path, but when they meet a wireless aerial, connected through a wireless receiver to the earth, they will set up in that circuit an electro-magnetic condition similar to that which was set up at the transmitting station, provided that the circuit is tuned to the particular length of the wave transmitted.

“Tuning” the Receiving Station.

The tuning of a receiving station to a transmitting station means the arrangement of similar electrical components so that the two are in electrical sympathy, as the “C” string of one instrument is in sympathy with the “C” string of another and will vibrate in unison with it. In wireless this electrical sympathy is obtained by means of a coil of wire known as an “inductance”, and metal plates, called condenser plates, which give an electrical quality called “capacity”. The combination of these two qualities, in certain proportions, in the circuit will provide a path for oscillations of electric current at high frequency. In other words, an electric current will run to and fro in such a circuit many thousands of times a second.

Determining the Wave-Length

A wireless receiving circuit will only respond to electro-magnetic waves of a certain frequency, or, in other words, of a certain wave-length; and it is by the arrangement of the two components, inductance and capacity, that the wave-length to which a circuit will respond is determined. The amount, and the proportion, of capacity and inductance, i.e. the condenser plates used, and the number of turns of wire in the inductance coil will determine the frequency

with which electro-magnetic impulses can travel along the aerial and through the instrument to earth; and this frequency determines the wave-length. This may readily be understood by picturing a measured distance, say of 1 ft., and drawing a wavy line to represent waves to fill that space. If the distance between the top of one wave and the top of the next is 1 in., there will be twelve waves within the foot—the wave-length will be 1 in. and the frequency twelve. If the distance between the top of each wave is 2 in., there will be six waves—the wave-length will be 2 in. and the frequency six. Electrical frequency is calculated in cycles, or complete waves, per second.

Some General Principles

By varying the length of the coil and the amount of capacity through which the electro-magnetic impulses have to pass, the frequency with which the current can change is varied, and therefore the wave-length to which it will respond. The more turns of wire called into use in the induction coil, the longer will be the wave-length to which the set will be tuned. This is the first adjustment to be made. Variation in the amount of capacity will also change the wave-length, and this means of doing so is generally employed to give clearer signals after they have been roughly tuned in by means of the inductance. In some simple receiving sets the two factors are so combined that the wave-length is determined by the movement of one handle only.

There is one other general principle which should be thoroughly understood. This is the action of the detector. A telephone receiver is not capable of responding to the high-frequency oscillations set up in the receiving aerial, and it is necessary to change these oscillations into a direct current which will actuate the telephones. This is done by means of a rectifier, or detector, which may either be a crystal or a thermionic valve. In either case the action is that of a valve which will allow electric current to pass in one direction only. After passing through the detector the signals become audible in

the telephones, and are identical with those sent from the transmitting station.

A crystal is nothing like as sensitive as a thermionic valve. This may be an advantage in places where there is a good deal of wireless interference, because an insensitive receiver will more easily reject signals to which it is not accurately tuned. A ther-

Whatever set you decide to buy, you will be well advised to go to a reputable firm and purchase an article which has a guarantee of good workmanship behind it. Do not go to a dealer who has no technical knowledge of wireless and whose only object is to make money by selling anything he can persuade you to buy.

A Crystal Detector Set

If you live within ten miles of a broadcasting station and are content to hear that station only, you will obtain very good results from a crystal detector set (fig. 127). This is of the cheapest type, and may be made for a few shillings or bought for a few pounds. Within ten miles of London a good crystal set will give satisfactory results with four, or five, and sometimes six pairs of telephones. If a loud speaker is preferred, a good combination for this distance is a crystal detector with what is known as a double-note magnifier; that is, two thermionic valves so arranged as to increase the signals, after detection, to such a strength as will satisfactorily operate the diaphragm of a loud speaker and make the signals audible to everyone in an ordinary drawing-room.

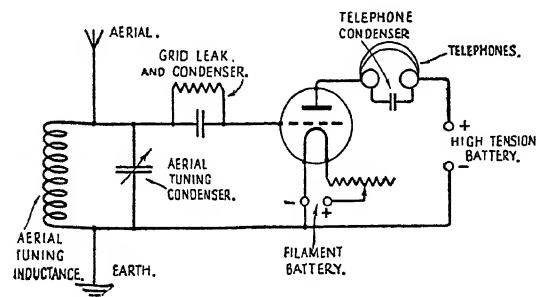


Fig. 125.—Simple Wiring Diagram of Single-Valve Receiver

mionic valve is the most sensitive electrical detector known. It will detect the weakest impulses, and can be made to magnify them thousands of times.

Installing a Receiving Apparatus

If you have decided to instal a broadcast receiving apparatus, the first things to consider are your distance from the nearest broadcasting station and the amount of money you can afford to spend on the installation. Do not be led away by the idea that your first outlay will cover your expenses. Wireless is such a fascinating pursuit that it is always tempting its devotees to spend more money in order to attain greater results, either in bringing more stations within reach or in adding apparatus which will enable more people to be entertained. In considering initial expenses, therefore, remember that if you purchase apparatus sufficient to enable two persons to "listen-in" to the nearest broadcasting station, it is more than likely that before long you will be wanting to hear other stations, or to ask some friends in for a "wireless evening". It is good policy to instal, in the first place, the best set you can afford. It will be the cheapest in the end.

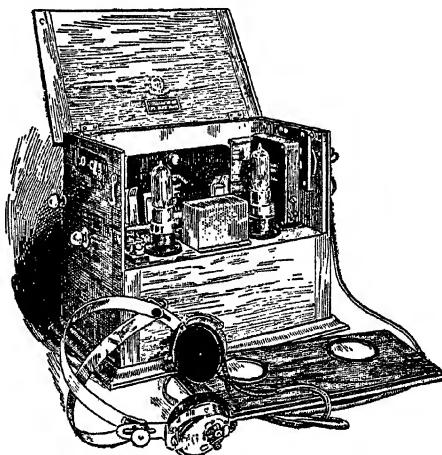


Fig. 126.—The Marconiphone V₂ Broadcast Receiver

A Valve Detector Set

If the programme of the nearest broadcasting station will not satisfy you, and you wish to hear the other English stations, and perhaps the French and Dutch broadcast concerts as well, it will be necessary to have a valve detector set (fig. 126). This will be more expensive, and one should be prepared to spend about £20 or £25 upon it. The cost of good valve sets ranges from this price up to £100 and over, and whereas, once you have installed a crystal set, your expenditure

can be used either for a valve or a crystal set; the indoor aerial, which can be suspended across a room; and the frame aerial, which consists of several turns of wire round a wooden frame a few feet in diameter. Indoor aeri-als are better used in conjunction with a valve receiver, but they are convenient in flats where no outside space is available. They do not, however, pick up so much energy as the out-door type, and are therefore not so efficient. The frame aerial is useful in situations where "jamming" is experienced, because it has a valuable pro-

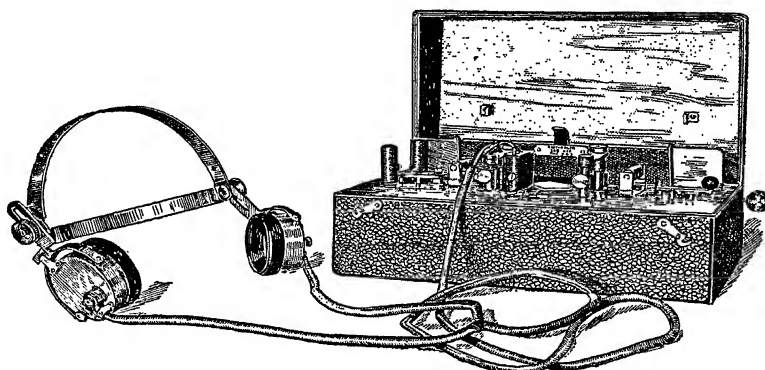


Fig. 127.—The Marconiphone Crystal Receiver with Two Types of Crystal

is practically complete, a valve set will require periodic renewals of the electric batteries which actuate the valves, and of the valves themselves. Batteries are also required, of course, for note magnifiers used in conjunction with a crystal set.

Making the Aerial

We now come to the question of installation, which is a very important factor in obtaining good results. It is not always the neatest and tidiest wireless installation that gives the best results; so do not be led away by a sense of tidiness into robbing yourself of a percentage of efficiency, though, of course, tidiness and efficiency may easily be combined.

The first thing to consider is the aerial. There are, generally speaking, three kinds of aerial—the ordinary outdoor aerial, which

is practically complete, a valve set will require periodic renewals of the electric batteries which actuate the valves, and of the valves themselves. Batteries are also required, of course, for note magnifiers used in conjunction with a crystal set.

Erection of Aerial

If there is plenty of space, a single wire aerial 100 ft. in length (including the lead in to the receiving set)—which is the full length allowed by the Postmaster-General—will give the best results. It should be as high as possible, and the vertical drop to the receiver should be as much as possible. If it is not convenient to erect a special pole for the purpose of suspending the end of the aerial farthest from the house, a tree will prove a useful substitute, but the aerial should be kept, as far as possible, clear of all other trees and of buildings. It should be at right angles to the house, if possible,

and should be led in to the receiver by the shortest possible path. Nailing along the surface of walls should be avoided, as this introduces an electrical effect which will reduce the strength of signals. Care should be taken that the aerial is well insulated from all its supports; and it is most important that an effective lightning arrester should be arranged, so that if lightning should strike the aerial it will flow harmlessly to earth without passing through the receiver. By neglect of this one precaution a receiver might easily be destroyed.

The Earth Connection

Another important thing for efficient

reception is a good earth connection. The best earth is a copper plate buried in the ground and connected to the earth terminal of the receiver by a copper wire. As an alternative, the earth wire may be connected to a water-pipe; but if this is done, it is advisable to see that the pipe runs direct to the ground and not merely to a cistern in the roof of the house.

The fullest directions as to the best method of installing and operating broadcasting sets will be given by the firms from which they are purchased, or may be found, by those who make up their own sets, in the numerous specialist wire-less periodicals.

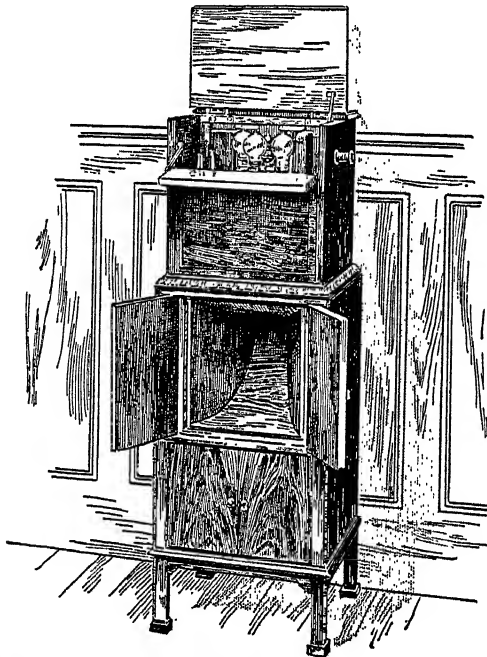


Fig. 128.—Marconiphone V, Broadcast Receiver with Loud Speaker

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